

# amateur radio

MAY, 1974



- A LINEAR AMPLIFIER
- A SIX METRE TRANSVERTER
- A  $\frac{1}{2}$  WAVELENGTH MOBILE ANTENNA
- MULTI-CHANNEL SWITCHING FOR THE VINTEN MTR13
- WIA SUBMISSION TO INDEPENDENT ENQUIRY INTO FM BROADCASTING
- 1973 RED CROSS MURRAY RIVER MARATHON



JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

# GRID DIP METER SPECIFICATION



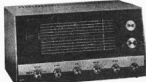
## Model TE-15

Freq. Range: 440kHz-280MHz  
in 6 Coils  
A Coil 0.44—1.3MHz  
B Coil 1.3—4.2MHz  
C Coil 4.14MHz  
D Coil 14.40MHz  
F Coil 120-280MHz  
Transistor: 3 TR's & 1 Diode  
Meter: 500uA F.s.  
Battery: 9V (BL-006P)  
Dimensions: 180x80x40mm  
Weight: 730g

Price \$36.50  
P & P \$1.00

## LAFAYETTE HA-600A SOLID STATE

- GENERAL COVERAGE  
5 BANDS 150-400 kHz, 550-1600 kHz (Broadcast band), 1.6-4.8 MHz, 4.8-14.6 MHz, 10.5-30 MHz.  
Operates from 12 Volts DC (negative ground) or 220-240 Volts 50 Hz.
- Field Effect Transistors in RF Mixer and Oscillator Stages.
  - Two Mechanical Filters for exceptional selectivity.
  - Voltage Regulated with Zener Diodes.
  - Product Detector for SSB/CW.
  - Edge Illuminated Slide Rule Dial with "S" Meter.
  - Continuous Electrical Bandspread Calibrated 80-100M Amateur Bands.
  - Variable BFO, Automatic Noise Limiter.
  - Speaker Impedance: 4 to 16 ohms.



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### SPECIAL FEATURES

1. Vertical sensitivity of 20 mV/cm, three step attenuation, AC DC operation & wideband frequency response from DC to 1.5MHz.
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Freq. Range: Sin: 20Hz-200kHz  
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Output Voltage: Sine: 7 volt.  
Square: 7 volt.  
Output Impedance: 1000 ohm  
Freq. Accuracy: +3% + 2Hz  
Distortion: Less than 2%  
Tube Complement: 6BM8  
12 AT7, 6Z4  
Power Source: 105-125, 220-240V AC, 50/60 cps. 19W  
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4 Ranges—1/1, 1/10, 1/100, 1/1K

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now price — \$189.00

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OA91	15c
807	\$2.00
1T4, 6C8, 1R5	75c
6BA6-6AK5-6V6G-6J6	\$1.00
2E26-QQEO4/7-QQEO4/10	
6SK7-ECH35-6K8G-5763	\$3.00
6SJ7GT-12AT7	\$1.50
Coil Formers 1 1/4" diameter	
Octal base	40c

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# amateur radio

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Copy is required by the third of each month. Acknowledgment may not be made unless specially requested. All important items should be sent by certified mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying any reason.

#### Advertising:

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### FRONT COVER

The new Headquarters for the Victorian Division, situated at 412 Brunswick Street, Fitzroy. The Division paid \$68,000 for the building and intends spending about \$10,000 on library, workshop and lecture theatre facilities.

### DIVISIONAL BROADCASTS

Do you have the time and want to keep in touch with events? If so here are the latest details available of Divisional broadcasts.

#### VK1WI

First broadcast scheduled for Sunday 21st April and thereafter same day and time:

10.00Z 3595 kHz  
 7146 kHz  
 145.5 MHz FM

BC Committee VK1VP, IMP, 2YS/1.

#### VK2AWI

11.00 local time Sundays:  
 3595 kHz AM  
 7146 kHz SSB  
 52.525 MHz FM  
 53.866 MHz AM  
 145.13 kHz AM  
 Hunter Branch Mondays 19.00h 80m.

#### VK3WI

10.30 local time Sundays:  
 1825 kHz AM  
 3600 kHz SSB  
 7146 kHz SSB  
 Ch1 FM

(subject to availability at present of relay stations whilst under re-location).

#### VK4WI

09.00 local time Sundays:  
 3590 kHz AM  
 7146 kHz SSB

re-broadcast on Ch B FM. BC officer VK4HB.

#### VK5WI

23.30Z Sunday mornings originating on 1.8 MHz band and relays as follows—

3.615 MHz by VK5ZQ  
 7.125 MHz by VK5NB  
 14.170 MHz by VK5TY  
 52.2 MHz by VK5ZEG  
 Ch 48 by VK5WB  
 VK5CM in Darwin on 2m  
 VK5DK in Mt. Gambier on 2m

#### VK6WI

09.30 local time on Sundays:  
 3600 kHz SSB  
 7080 kHz SSB  
 14100 kHz SSB  
 52.656 MHz FM

#### VK7

09.30 local time on Sundays originated on Mt. Barrow 2m repeater VK7RAA and re-broadcast in Launceston area 3672 kHz SSB, 7130 kHz AM and in Hobart area on 53.032 AM, 144.1 MHz AM, 146 MHz FM and 432.1 MHz AM.

**50MHz****HIGH STABILITY VFO PLUS /  
PHASE LOCKED SYNTHESIZER !!****TRANSCEIVER****VHF SSB 10W****IC-501**

- FEATURES:**
- 50-54MHz
  - SSB, AM, CW
  - 10 WATTS P.E.P.
  - USB, LSB, AM, CW
  - XTAL FILTERS FOR AM AND CW
  - VFO OPERATION WITH XTAL STABILITY USING PLL TECHNIQUE
  - RECEIVER SENSITIVITY  
A3,  $\phi$ db $\mu$  (S+N) / N 10db  
A3J, A1, —8db $\mu$  (S+N) / N 10db  
NOTE:  $\phi$ db = 1 $\mu$ V
  - 4 XTAL CHANNELS AVAILABLE
  - SIZE 111 x 230 x 260 mm, 5.1 kg WEIGHT

**COMING SOON! IC201 2m SSB TRANSCEIVER!****PRICE \$398**

**Plug-in Power Supply AC  
EXTRA \$35  
ALL PRICES INCLUDE FREIGHT  
AND S.T.**

For other VHF Equipment  
see advt. this issue.

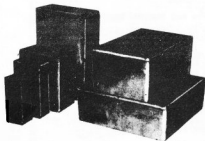


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- 6357/P 7 1/4" L x 4 1/4" W x 3" D
- 7134/P 4 1/4" L x 2 1/4" W x 1" D
- 6827/P 7 1/4" L x 4" W x 2" D
- 7970/P 7 1/4" L x 7 1/4" W x 2 1/2" D

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**ECONOMICAL SSB!**

*from YAESU*

# FT-200 FIVE-BAND TRANSCEIVER

## GENERAL DESCRIPTION

## TECHNICAL DATA

( ) OPTION

A superb quality, low cost, versatile transceiver. Covers 80-10 mc, tuning range 500 Kc. each band. On 10 mc, crystal supplied for 28.5-29 Mc. (Crystals available optional extra for full 10 mc coverage.) SSB, CW, AM; with a speech peak input of 300w. Transistorised VFO, voltage regulator, and calibrator. 16 valves, 12 diodes, 6 transistors. PA two 6JS6A pentodes. ALC, AGC, ANL, PTT and VOX. Calibrated metering for PA cathode current, relative power output, and receiver S units. Offset tuning  $\pm 5$  Kc. Uses a 9 Mc. crystal filter with bandwidth of 2.3 Kc. at  $-6$  db. Selectable sidebands.

Provision for use of optional external VFO, FV-200 VFO includes fixed channel facility.

Operates from conservatively rated separate 230 volt 50 c.p.s. AC power supply, FP-200, which includes built-in speaker. Transceiver incorporates power take-off and low level R.F. drive outlets suitable for transverters.

Cabinet finished in communication grey lacquer. Panel, etched, satin finish aluminium.

### MODE OF OPERATION:

### FREQUENCY RANGE:

### FREQUENCY STABILITY:

### SPURIOUS RESPONSE:

### ANTENNA IMPEDANCE:

### CARRIER SUPPRESSION:

### SIDE BAND SUPPRESSION:

### 3 RD HARMONIC INTERMODULATION DISTORTION:

### TRANSMISSION BANDWIDTH:

### RECEIVE SENSITIVITY:

### FILTER SELECTIVITY:

### I.F. MIXING BEATS:

### IMAGE INTERFERENCE:

### AGC CHARACTERISTIC:

### RECEIVER OUTPUT POWER:

### WEIGHT:

### DIMENSIONS:

SSB(A3J), PHONE(A3H), CW.

3.5-4.0, 7.0-7.5, 14.0-14.5,  
21.0-21.5, (28.0-28.5),  
28.5-29.0, (29.0-29.5),  
(29.5-30.0 MHz)

AFTER WARM-UP, 100 CPS/30 MIN.

BETTER THAN  $-40$  db

50-1000 UNBALANCED

BETTER THAN  $-40$  db

$-50$  db AT 1000 CPS

$-30$  db (P.E.P.)

3 KHz

$0.5 \mu V$  S/N 10 db

2.3 KHz ( $-6$  db) 4 KHz ( $-60$  db).

50 db DOWN

50 db DOWN

AMPLIFIED AGC

1 W (AT 10% DISTORTION)

17.6 LBS

$13 \frac{1}{2}$ " wide,  $5 \frac{1}{2}$ " high, 11" deep.

Price including Sales Tax, excluding freight

FT-200 - \$331.00

FY-200 - \$115.00

FP-200 - \$90.00

Prices and  
specifications  
subject to change



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**Penetrant:** Penetrates to loosen frozen parts in seconds.

**Volume Resistivity per ASTM D-257:** Room temperature, ohm/cm.;  $1.04 \times 10^{12}$ .

**Dielectric Constant per ASTM-877:**

Dielectric Constant 2.11, Dissipation Factor: 0.02.

**Dielectric Strength per ASTM D-150:**

Breakdown Voltage 0.1 inch gap, 32,000 volts.

Dielectric Strength volts/inch, 320,000 volts.

**Flash Point (Dried Film),** 900 degrees F.

**Fire Point (Dried Film),** 900 degrees F.

**TESTS AND RESULTS:** 950 degrees F.

**Lawrence Hydrogen Embrittlement Test for Safety on High Tensile Strength Steels:** Passed. Certified safe within limits of Douglas Service Bulletin 13-1 and Boeing D6 17487.

**Mil. Spec. C-16173 D-Grade 3,** Passed.

**Mil. Spec. C-23411,** Passed.

**Swiss Federal Government Testing Authority for Industry:** Passed 7-Day Rust Test for acid and salt water. Passed Weiland Machine Test for Lubricity as being superior to mineral oil plus additives.

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### TWO NEW INSTRUMENTS FOR AMATEURS

**200MHz Counter Kit** (EA Dec 73). Fully solid state with latest MSI, ICs and LED Readout. Uses 23 ICs so it's straightforward to build and very economical. Our kit is in two parts—basic counter, 4½ decades to 20MHz, complete kit (Yes crystal included!) for only \$99.00 Prescaler to 200MHz only

\$26. So you can build a complete 200MHz counter for only \$125.00. (All P & P 50c).

**Digital Voltmeter** (EA Oct 73) with 3½ digit read-out and 0.5% plus or minus 1 digit accuracy. Uses the Analog Devices LED panelmeter. Complete kit covers 200mV to 2kV and 20 ohm to 200k for just \$145.00. Panelmeter alone \$102.00 (Data in our catalogue) P & P 50c.

### KITS



The ever popular 2 Metre kit as built by Jim Rowe in Electronics Australia Jan. '74. "Confidently recommended" — Quote!! Don't fiddle around, fork out \$37.50 for the full kit (less metalwork) and save \$5 on the 3 stages. (P & P 30 cents)

### NEW, NEW, NEW 6 METRE AMP

Following Jim's article and his suggestions we have produced a 6 Metre version. In future all kits will have instructions for both 2 and 6 Metre circuits. Since the gain is higher at lower frequencies, the 6 Metre job only takes two stages the one using a 2N5590 is not needed and the drive is only 100mW (an MPF121 amplifier is excellent). Cost of the 6 Metre kit is only \$28.50. (P & P 50 cents)

### BOOKS

We must have the best selection of books for the electronics/amateur radio enthusiast. We import some from overseas ourselves, having checked their suitability. New titles just in include: **Radio Amateur Callbook** (USA) gives an alphabetical directory listing by call letters of names

and addresses and class of licence for every radio amateur in the States. Possessions and personnel overseas. Over 283,000 K and W calls are listed. A must for every serious Ham and SWLs. Yes, over a quarter of a million calls listed. New edition just published has over 600 pages, \$9.95. (P & P \$1.00)

**Foreign Radio Amateur Callbook** (DX Listings) covers over 211,000 radio amateurs outside the USA. Companion volume to above. Latest edition runs to over 400 pages, \$9.95. (P & P \$1.00)

Get the two volumes for just \$18.95 (P & P \$1.00), saving you \$1.95 on combined purchase.

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**Radio Amateurs DX Guide**. A wealth of information — International DX log. World Map with prefixes. US greater circle maps. ARRL section map. Time tables, etc. etc. 64 pages. \$3.00. (P & P 50 cents) 1974 Annuals now in stock. New ARRL Handbook has just arrived. Last year's price — only \$6.50 (P & P 50 cents)

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2-16	3/8	16	No. 3007	88c
3-08	3/4	8	No. 3010	\$1.06
3-16	3/4	16	No. 3011	\$1.06
4-08	1	8	No. 3014	\$1.19
4-16	1	16	No. 3015	\$1.19
5-08	1 1/4	8	No. 3018	\$1.32
5-16	1 1/4	16	No. 3019	\$1.32
8-10	2	10	No. 3907	\$1.91

Special Antenna All-Band Tuner Inductance

(equivalent to B & W. No. 3907 7 inch) 7" length, 2" diam., 10 turns/inch.

Price \$3.30

References: A.R.R.L. Handbook 1961: "QST" March, 1959  
Amateur Radio, Dec. 1959  
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Perth: W. J. MONCRIEFF PTY. LTD., 176 Wittenoon Street, East Perth., 6000. Phone: 25-5722, 25-5902.

Brisbane: FRED HOE & SONS PTY. LTD., 246 Evans Road, Salisbury North, 4107. Phone: 47-4311

Adelaide: ROGERS ELECTRONICS, P.O. Box 3, Modbury North, S. A. 5092. Phone: 64-3296.

## FEDERAL CONVENTION

The 38th Federal Convention held in Sydney during the Easter holidays is now a talking point.

Every Convention earns a nickname. This one was the Procedural Convention.

A brand new Division was admitted into the WIA — the WIA ACT Division Inc. The VK1 Division is now a reality. This event did generate considerable constitutional discussions.

However, this Convention also decided that surprises should be the order of the day.

The Victorian Division withdrew en bloc on a procedural tangle. The Secretary resigned and walked out.

Both returned thanks to good sense and diplomatic moves.

Without a VK3 Division the Institute would certainly appear peculiar to say the least. If the Secretary goes, get another.

Traumatic? But doesn't this indicate our slip shows on so many occasions? The NSW Division voting last September becoming a damp squib thanks to the good sense of members was another example. But can the Institute withstand too many doses of brinkmanship? The view of Lake Burley Griffin from 10 000m whilst flying back from Sydney somehow highlighted the intense commercialism surrounding us and the intrusion of politics into our lives.

Is it necessary for any of us in amateur radio to ape the antics of politicians or the power games of commerce?

An observer at the Convention could well have thought this even though the intent was not there.

The Convention was essential — make no mistake about this. Where in it all can be found the help that each member hopes to be at hand when needed. Probably in better understanding, better administration, better appreciation of common problems.

Amateur radio as such did not receive attention in great depth because other matters pre-occupied the time available. Finances, budgets and inflation however were closely examined.

The element necessary to cover the costs of AR, IARU representation and the continuance of the central Executive office in 1975 was raised by \$2.60 with the greatest reluctance from the present \$7.20 p.a. All Councillors fully understood the implications which will reflect upon the annual subscriptions payable. But the facts of life cannot be swept under the carpet.

Whatever the outcome, the WIA is here to serve the members. The Executive will continue to serve the members of the Institute, Australia-wide, to the best of the ability of each amateur elected to the Executive. Amateur radio is a wonderful leisure activity — it deserves the very best effort by everyone.

D. A. Wardlaw Federal President

## VICTORIAN DIVISION

Correspondence received by the Executive Office shows that many members do not distinguish between the WIA (i.e. Executive) and the WIA Victorian Division. Mail arrives at one office but in reality refers to matters within the others' jurisdiction. The offices are several miles apart. In the absence of any regular courier service between the two or incorrectly addressed mail must therefore be re-directed. This causes delays apart from involving the Institute in extra costs in postage and time. The following are the main items dealt with by the Executive Office —

- Amateur Radio
- Call Book (except incorrect listings)
- Magpubs
- WIA Subscriptions processing (but not changes in amounts and not new members)
- WIA EDP membership records, changes of address and the like.

Please do not include Victorian Division matters in letters (etc.) referring to Executive matters.

## EXECUTIVE OFFICE

Because of the operation of 'flexihours' and staffing difficulties the Executives' Office in Toorak will not normally be manned before about 10.30 a.m. on working days. If any member has any occasion to telephone the office it would be best if this could be done in the afternoons. Members in Victoria are specially requested to ensure that calls to the office should be confined to matters dealing with Executive affairs (such as Amateur Radio, Magpubs, etc.). Matters of a Divisional nature (such as components, membership, classes, meetings, etc.) should of course be referred to the Victorian Division.

## BREAK-IN

From 1st July 1974 the annual subscription to NZART's journal 'Break-In' will be \$4.20 when purchased through Magpubs. Subscribers to this service who pay or have paid before 1st July will naturally continue at the old rate.

## NEW PREFIXES

Radio Communications, Feb. '74, quotes ITU as having allocated the following call sign series — P2A-P2Z Papua New Guinea, P2A-P2Z Papua New Guinea, P2A-P2Z Papua New Guinea.

## DELAYS TO CORRESPONDENCE

The Executive office has been severely inundated with subscriptions processing and other pressing matters since mid-November. For periods there was also an absence of typing and clerical assistance. During March the office was heavily engaged in dealing with pre-convention material. Consequently there have been some delays in answering correspondence and any member so affected is requested to be as patient as possible although in most instances any requested action was done on receipt of the letter concerned.

## POLLUTION

'The electromagnetic garbage which 'festevated' our 20-metre band during the summer and early fall (complex signals every 4 kHz) was finally cleared up after an unprecedented amount of diplomatic and administrative pressure had been brought to bear by the United States and Canada. Most of what was heard in North America originated in Cuba, but our friends in Europe had similar interference coming from at least one station in the USSR. The amount of time and energy devoted to this problem by the W and VE administrations was indeed gratifying.' QST, Jan. 74.

## SSB BROADCASTING

Pat Hawker (G3VAV) writes in Radio Communications for Feb. '73 in his Technical Topics Column, "From time to time we have referred to the work going on in various parts of Europe in an effort to develop domestic receivers which would be suitable for either SSB or AM broadcasting. Most of these systems use synchronous (product) detection either by the use of phase-locked loops or the reconstitution of a phase-coherent carrier from the incoming signal. While I feel that widespread use of SSB broadcasting is still some way away, there is no doubt that some very interesting techniques are emerging from this work. One of his (G3VAV) contributions represents an independent development of the half-and-pull type of oscillator stabilisation as a means of overcoming the problem of expecting broadcast listeners to tune to SSB signals (for music this needs to be an accuracy of about 2 to 5 Hz compared with the 50 Hz which is about adequate for speech communication)."

## ITU CONVENTION

The IARU Region 1 News for Dec. '73 reports as under on the recent ITU Conference.

"The Plenipotentiary Conference of the International Telecommunication Union met for six weeks (from 14 September to 25 October) at Malaga-Torremolinos (Spain) and ended with the signing of the new International Telecommunication Convention by the representatives of 132 ITU Member countries.

The Conference, which is the supreme organ of the Union was convened to consider and revise the Union's basic document the Convention, drawn up by the previous Plenipotentiary Conference held in Montreux, Switzerland, in 1955, and to decide whether the new document should take the form of a convention, as hitherto, or that of a Constitutional Charter.

The Conference, attended by 655 delegates from 132 countries, finally decided to retain the Convention form, dividing it into two parts: the Basic Provisions containing articles of a permanent nature; and the General Regulations, containing the rules governing the functioning of the various organs of the Union.

The Convention will come into force on 1st January, 1975."

## STOP PRESS

**Customs Department Canberra advise Amateur Transceivers up to and including 29.7 MHz are included in Consolidated By-Laws from 1st April 1974, as duty-free in their own right. Ref.: CG72/78684.**

## EXECUTIVE MEMBERS 1974

The Convention elected the following: Dr. D. A. Wardlaw VK3ADW, Surg.-Capt. E. J. Lloyd VK3CDR, Messrs. J. J. Martin VK3TJ, D. H. V. Rankin VK3QV, K. V. Rogert VK3YQ and P. A. Wollenden VK3ZPA. The Secretary, P. B. Dodd VK3CIF, continues in office.

# 1973 Murray River Red Cross Marathon

Roly Roper

C/o PO Box 150, Toorak, 3142

On Wednesday 26th December 1973, the WIA commenced its second involvement with the Red Cross in the staging of the Murray River Marathon.

Over thirty operators with more than ten vehicles slogged it out for five days, working their way from Yarrowonga to Swan Hill along the river.

This WICEN exercise is probably the toughest and most realistic yet devised with real traffic (concerning the safety of real people) being passed continuously through the long days. The toll on people and equipment was heavy — but the amateur spirit was abundant; whatever went wrong was fixed and whoever was ill was nursed back to health by the kind efforts of the Red Cross First Aiders.

Each day a complex net was set up on 80m SSB and 2FM (1 and/or B) consisting of net control, five or six riverside stations at checkpoints, up to seven boats on the river, a relay group, two medical evacuation vehicles (Medivacs) and a forward reconnaissance party. 10M SSB was used for a few hours to find its effectiveness in the flat terrain.



"Botatism" (Morrie VK3BMD) showed an admirable sense of 'esprit de corps' by putting on his WIA tee-shirt on Boxing day and refusing to remove it until New Years Day.

After Bob VK3BMA came down with a stomach wog, most operators opted for tinned supplies rather than drink the water and a new Q code was coined "QBB" (which is perhaps better left undefined here).

Those present included:

VK3s AVJ, ZRG, BMD, ZZU, TX, YQ, BGY (and wife), AUI, ROLY ROPER, ZKO, ZCO, ZAZ, YGK, ZLP, YGY, ZSQ, ZCX, ZMM, (CAPT)JOR, YJM (YJ What his name?) SS, ZJS, YCQ, AUR, YHJ, JOHN COX, VK, YBM, YJE, NEIL MATCHEN, AYL and "locals" Z2EO (who dropped down from Deniliquin) REX 3VL, **Beekeeper** GEORGE 3AGM and wife, BRUCE 3BM and visitors BAF and WW, all of whose assistance both on and off air was greatly appreciated.



ROBERT VK3AVJ with his mobile rig, complete with "heat sink".

On the lighter side, the group sponsored one of the First Aiders, Barbara Taczanowski in the Queen of the Marathon Quest and she repaid our confidence in her by winning.

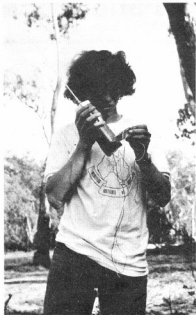
The exercise was organised by RAY VK3ZRG and KEITH VK3YQC, who were assisted by "Capt" John VK3OR.

LEFT. Barbara Taczanowski, the Queen of the Marathon Contest.

The willing assistance of the Land Rover Owners Club (LROC) was essential as the area (particularly the Barmah Forest) had been recently flooded leaving many tracks impassable and the heavy rain on day 4 only made the situation worse.

On more than one occasion LROC members rescued WICEN teams whose enthusiasm and dedication caused them to take on tracks that were better left to four wheel drive vehicles.

RIGHT. Keith VK3YQC, Dean (Key Section) VK3TX brass pounding in the van of Robert VK3AVJ, and VK3ZCX.



MARTIN VK3YJM (YJ what's his name?) with Ken hand-held unit.

Operating in recently flooded country took on a new dimension with the Queensland floods and any person who thinks WICEN is not needed need only glance at the latest copy of APO News, "... an estimated 35,000 telephone services in the state were out of order at one time as a result of flooding, ..." and at Ipswich exchange, "... traffic levels were running as high as three times more than the system could handle."

Anybody interested in joining in WICEN activities should contact Keith VK3YQC, Ray VK3ZRG, or drop a note to PO Box 63, Kew 3101.

# experiments in modulation and audio

## part three

J. A. Adcock, VK3ACA  
P.O. Box 106, Preston, 3072

This month the third part of this series is presented. It describes the rarely used fourth method of generating SSB.

### GENERATING OF SSBSC BY THE FOURTH METHOD, System 4

This method and variants of it have been called the fourth method. There is already a third method. This method is a development of the method of generating DSBSC described in system 1. It consists of first generating the frequency component of the SSB signal and then impressing the amplitude component of the signal on it. This is done in a class "C" final.

For a single side band signal let  $A \sin \Theta_1$  be the audio wave form where  $A$  is the amplitude component and  $\Theta_1 = 2 \pi f_1 t$ . Let  $B \sin \Theta_2$  be the RF wave form where  $B$  is the RF amplitude and  $\Theta_2 = 2 \pi f_2 t$ .  $A \cos \Theta_1$  and  $B \cos \Theta_2$  is the above RF wave-form when shifted 90 degrees.  $A$  and  $f_1$  are variable whereas  $B$  and  $f_2$  are fixed for a particular case.

The general expression for SSB from the phasing method is given by:

$$A \sin \Theta_1, B \sin \Theta_2 + A \cos \Theta_1, B \cos \Theta_2 \quad (5)$$

From the identity:

$$a \cos \Theta + b \sin \Theta = \sqrt{a^2 + b^2} \cos (\Theta + \alpha) \quad (6)$$

$$AB \sqrt{\sin^2 \Theta_1 + \cos^2 \Theta_1} \cos (\Theta_2 + \Theta_1) \quad (6)$$

The left hand side of the product is only audio and represents the envelope of the wave. The right hand side is only RF and by itself represents the frequency component of the side-band, with the amplitude removed. On the left hand side,  $B$  is a constant and can be removed, so we have envelope:

$$= A \sqrt{\sin^2 \Theta_1 + \cos^2 \Theta_1} \\ = (A \sin \Theta_1)^2 + (A \cos \Theta_1)^2$$

which is the expression for the amplitude curve given in equation (4). If the expression for an SSB signal, equation (6) is divided by the envelope wave form, equation (4), we are left with RF with no amplitude variation. Similarly if the audio wave form is divided by the envelope wave form we get audio without amplitude variation — thus  $\frac{A \sin \Theta_1}{A} = \sin \Theta_1$ .

This is the basis of system 5 to be described briefly later in part 4 of the series.

$$\text{Using the equations } \frac{A \sin \Theta_1}{A} = \sin \Theta_1$$

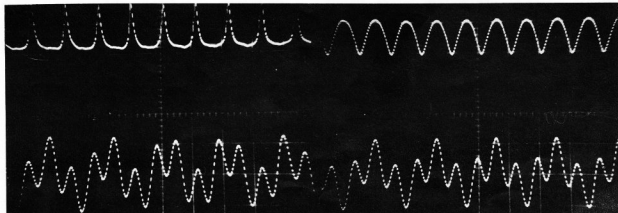
$$\text{and } \frac{A \cos \Theta_1}{A} = \cos \Theta_1 \text{ in the phasing}$$

system, sideband can be produced without amplitude variation. That is by substituting the above into equation (6) we get  $\cos (\Theta_2 + \Theta_1)$  only. Since this signal is without amplitude variation, it can be generated in an early stage of the transmitter and amplified by class C stages. The amplitude (or envelope) wave form "A" derived from equation (4) can be used to high level modulate a class C final to produce the original side band signal of equation (6). Such a system is shown as a block diagram in fig. 9.

The system above has never been tried in that form. As described it is a complicated and difficult method of putting side band together. The chief disadvantage is that it would require a direct coupled series modulator for the amplitude component.

Can the above system be simplified? In the first place, since a fully clipped side band is most desirable, why put the amplitude on the signal at all?

(There is no evidence to support the desirability of a fully clipped sideband signal. Anyone who has attempted to use much more than 20dB of clipping, will realise that increases in average power are accompanied by increases in distortion. Eventually, although the signal is a little



PHOTOGRAPH 3.—ENVELOPE WAVEFORMS  
Horizontal Scale, 1 division 1 ms. Upper Trace, Two tone audio input. Lower Trace, Envelope waveform produced by computer. This waveform corresponds to that defined in equation 4.

PHOTOGRAPH 4.—FREQUENCY DEVIATION WAVEFORMS  
Horizontal Scale, 1 division 1 ms. Upper Trace, Two tone audio input. Lower Trace, Voltage proportion to frequency deviation as defined in equation 7.

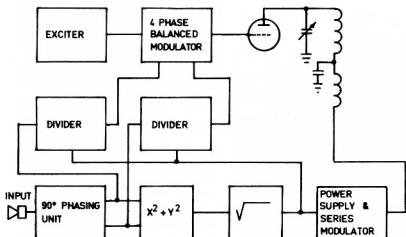


FIG 9 SSB MODULATOR FIRST VERSION DESCRIBED

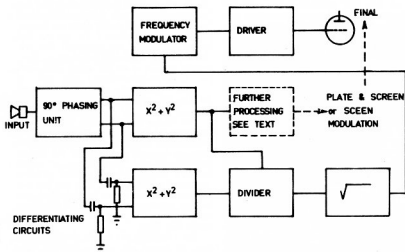


FIG 10 IMPROVED SSB GENERATOR

stronger, it is unintelligible. — Technical Editor.)

In the second place it is possible to derive the amplitude curve and impress it on the signal containing the frequency components. It is also possible to derive the frequency deviation curve and frequency modulate the oscillator with it.

The equation to produce the frequency deviation curve is shown thus:

$$\text{Frequency deviation} = \frac{d(A \sin \Theta)}{dt} + \frac{d(A \cos \Theta)}{dt} \quad \dots (7)$$

$$\sqrt{(A \sin \Theta)^2 + (A \cos \Theta)^2}$$

At present no explanations or derivations are offered for this equation. A block diagram of the system is shown in fig. 10.

If a sine wave of varying frequency and amplitude is fed into the system of fig. 10, a DC voltage will appear at the output of the computer with value independent of amplitude, but proportional to frequency. If this signal is fed into a frequency modulator, it comes out as single sideband. (Without the amplitude variations of course. These must be added later. — Technical Editor.)

The amount of deviation used must match the frequency excursions in the original audio. Also, like most of the circuits described so far, the system must be DC coupled from the  $x^2 + y^2$  units to the frequency modulator. Note that the output from equation (7) will have one sign only, that is, it is a varying DC voltage.

It is suggested that some form of compressed amplitude modulation be used in the final so that a very much compressed amplitude of the original envelope is impressed on the final signal. The signal will now be cut off between sounds. The final result should sound like side band with RF clipping.

Very briefly a compressed amplitude curve could be obtained by the formula  $\frac{A}{a + A}$  where  $a$  is a small constant value

as compared with  $A$  peak. This is suggested by the dotted square on fig. 10. See also system 5 and equation (8).

To be concluded.

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## Afterthoughts

### EXPERIMENTS IN MODULATION AND AUDIO — Part two

The symbol 0 is intended to be Theta. Equation 1 should have read:  $A \sin \Theta \times A \cos \Theta = \frac{1}{2} A^2 \sin 2 \Theta$   
Equation 3 should have read:  
 $\pm \sqrt{A - A \cos \Theta} = \sqrt{2} A \sin \frac{1}{2} \Theta$   
The  $\sqrt{A}$  should appear before every  $\sin \frac{1}{2} \Theta$ .

an AR special

# WIA Submission to the Independent Enquiry into FM Broadcasting

In December last year the Federal Government announced the terms of reference for an Independent Enquiry into FM Broadcasting. The WIA, through the VHF Advisory Committee, prepared and presented submissions to the Enquiry with a twofold purpose. Firstly to present an argument that in the public interest the proposed FM BC service should be established in the generally accepted 88-108 MHz international FM band; and secondly to advance the standing of the WIA in the community.

The establishment of an FM broadcasting service has been considered by a number of enquiries over the years. These were held in 1941/42; 1957/58; 1971, and again in 1974. The first enquiries generally came out against FM, but in 1947 experimental stations were set up in Sydney and Melbourne, and later in Brisbane and Adelaide. In 1956 the TV service was established, and a 10-channel plan was used which kept the region 92-108 MHz free for use by FM if required. In 1959/60 the ABCB (after public hearings on TV licences) determined that 13 channels would be necessary for an adequate TV service. The Huxley Committee, on behalf of the PMG, allocated a number of new channels including those on 94-101 (Ch4) and 101-108 MHz (Ch5). This meant that virtually all the 88-108 MHz international FM band was lost to TV. At the 1971 enquiry, the ABCB decided that an FM service should be set up on UHF, either (preferably) between 470-510 MHz, or between 500-540 MHz. This was an unpopular decision in many circles, and when the Whitlam Government came to power it was decided to review the question once more.

Australian Amateurs are fortunate to have been given the opportunity to comment on that 1971 decision. Establishment of an FM service between 470-510 MHz would present a threat to our 420-450 MHz Amateur band. If that allocation were confirmed, the only direction for expansion of the 450-470 MHz land mobile band would be downwards. The 70 cm band is of great value to amateurs. It is the only band below 1 GHz which is wide enough to accommodate high definition TV and other broadband modes.

Afny serious lobbying from the top end

to make room for commercial land mobile services would ruin it.

We are equally fortunate that our own interests in not wanting the FM BC service to be set up on UHF could be strongly argued as being in the public interest as well.

Much of the opposition by the public to providing a UHF FM service was inspired by financial motives, and many owners of imported FM receivers wanted a VHF band service. However, notwithstanding the volume of dissatisfaction with the ABCB 1971 recommendation, their justification has not received much technical criticism. The VHF Advisory Committee subjected the ABCB report (the "Red Book") and their Technical Report No. 34 (1973) to close examination, and found some flaws in the argument put forward for UHF. A detailed submission was prepared and presented to the new enquiry, the essence of which is given below.

The Institute submission put the proposition that an FM service could be set up in the international FM band with very little disruption to TV services. This could be done if FM stations were co-sited with local TV transmitters, and in those areas which have TV on channel 5 the FM transmitters should be on the channel 4 frequencies. Conversely, where channel 5 TV existed, the local FM transmitters could occupy channel 4.

This proposition was considered to some extent by the ABCB in their Technical Report No. 34 — "The sharing of TV channels". This is a very detailed document, and is generally opposed to the idea of channel sharing. However, in the view of the WIA, the report did not present a convincing case against the basic idea.

When our proposal was put forward within the Committee, TV channel allocations throughout the country were then examined to find, in particular, the distribution of TV channels 4 and 5. Following this, a map study quickly pinpointed the one main problem area:— Wollongong — Sydney — Newcastle, with overlapping service areas. Thus any high power FM station set up on Channel 5 in Wollongong could be expected to interfere with the pictures of those in the overlapping service area trying legitimately to watch Newcastle channel 5.

A number of other places had channel 4 and 5 in adjoining areas, but in these cases the TV service was derived from

low power stations or translators, with limited service areas and no overlaps, so that co-siting of low power FM transmitters on unused channels would be practical.

It was proposed by the WIA that the NSW central coast problem could be overcome by changing the Newcastle channel 5 transmitter (an ABC station) to channel 6. This proposition was considered by the ABC in their 1971 enquiry into FM broadcasting. It was rejected because of adjacent channel and local oscillator interference problems which would prevent Newcastle viewers from watching channel 7 and 10 respectively from Sydney. The ABCB favoured channel 0 as the alternate channel for Newcastle channel 5 TV, but the WIA could not accept this proposal! The protection of the Sydney TV service for Newcastle viewers does not seem reasonable — no such consideration was given to Ballarat viewers who were trying to watch Melbourne's channel 7 when BTV6 was set up.

The WIA contended that if the above channel re-allocation was made, with some other minor adjustments it would be practical to establish an adequate FM service between 92 and 108 MHz throughout the country. The benefits of vertical polarisation for the FM service were pointed out. Mobile reception would be simplified, and mutual interference between TV and sound broadcasts would, in most areas, be made even less likely.

The proposals for co-channelling of FM and TV broadcasts put by the WIA have several advantages.

- The necessary spectrum space can be had at low cost. The cost of changing channels for a TV transmitter is not high, relatively speaking. Newcastle viewers upset by the change would hopefully regard the introduction of a quality sound broadcasting system as a reasonable compensation.
  - The interests of international uniformity would be maintained — the unknown and probably high costs of Australia being the only country to establish an FM service on UHF would be avoided; and the million or so owners of standard FM receivers would form a solid audience for the new service from its inception.
  - The threat to the 70 cm amateur band would be eased.
- Co-siting FM and TV transmitters must



be beneficial to broadcasters for geographic and (where masts can be shared) economic grounds. In the latter case the visual pollution of very high masts cluttering the horizon would be held to a minimum.

The Institute recommended that the FM service be phased in over a number of years. The early establishment of UHF TV was advocated as a means of ultimately closing down all channel 4 and 5 TV transmitters (and by the way certain other channels — notably 0 and 5A — could be relocated to UHF with benefit to viewer and amateur alike). Arranging for the ultimate transfer of these stations to UHF would make the entire 92-108 MHz segment available for FM throughout the country, should it ever be required.

The WIA case was presented to the Enquiry on 5/2/74 by members of the VHF/UHF Advisory Committee. They were Technical Editor (for AR) Bill Rice VK3ABP, assisted by the Advisory Committee chairman, Peter Wolfenden, VK3ZPA. The main WIA case had previously been presented to the enquiry in writing, and the verbal submission mainly sought to clarify items by the written submission, and to comment on the ABCB Technical Report No. 34 (which document had impressed the chairman, Sir Francis McLean, with its detail).

A number of interesting items arose at the Melbourne hearing, including:

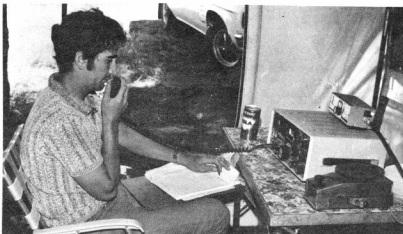
- (a) That the probability of the FM service being established on VHF seemed high, as was the likelihood of the Department of Transport losing its Distance Measuring Equipment (DME) allocation just above 200 MHz.
- (b) The WIA submission was the only predominantly technical submission other than that of the Department of Transport, heard in Melbourne on that day.
- (c) All those presenting submissions witnessed in Melbourne favoured VHF for the FM service.
- (d) The land mobile "low-band" may well be moved to UHF, and the transfer of this service could itself pose a threat to our 70 cm band.

As this article was prepared, reports were just beginning to appear of the findings of the Enquiry. It is pleasing to note that the bulk of the WIA submission was accepted by the Enquiry — even to a recommendation being made on the early establishment of a UHF TV service. Of course, we have no way of knowing how significant our efforts were in achieving the final outcome, but there is satisfaction in having been on the "winning" side.

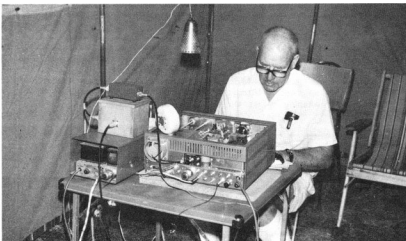
The Institute was thanked for having taken an active interest in the enquiry by a senior officer of the ABCB, even though the WIA had taken issue with certain of their technical proposals. From this incident it is apparent that the efforts of the Institute have also been worthwhile from the public relations point of view.

VK3ZDW

## MOORABBIN DISTRICT CLUB ON FIELD DAY 1974 - VK3APC/P MOUNT MARTHA



ABOVE: John VK3ANM, 80 and 10 metres.



ABOVE: Basil (the Brass Pounder) on 40 CW and Phone.

BELOW: Ray VK3BHL 160 metres CW and AM.



# a Six Metre Transverter

MIKE TRICKETT, VK3ASQ

8 Matlock St., Hume Hill, Geelong, 3220

This is the Six-metre version of the transverter described in the December issue of AR. The two transverters plus an FT200 or similar transceiver make up a complete VHF SSB installation.

From the block diagram, it can be seen that the transmitter section consists of four stages, an oscillator at 24MHz, mixer stage, driver and PA stages. The unit described produces in excess of 60 watts RMS into a 50 ohm load, with full carrier or tone in. As with the two metre unit a few criteria were kept in mind utilisation of the FT200 low level output and power supply, 28MHz as the IF, eventual dual-band operation with 2 metres. This transverter was constructed on the same chassis as the 2 metre unit. A 4 pole change over switch on the front panel facilitates band change giving 6 and 2 metre operation with a minimum of fuss.

## CIRCUIT DESCRIPTION:

The oscillator V1 produces 24MHz output. With this oscillator circuit, either a 12 or a 24MHz crystal can be used. The output has a double tuned circuit at 24MHz to minimise any 48MHz harmonic content. In the mixer stage the 24MHz and the 28MHz SSB, at about 1 watt PEP, are mixed. The resultant 52MHz signal appears at L4, and is then amplified by V3 and V4. Transmit-receive switching is accomplished

by switching the bottom leg of the two voltage divider networks from the -100 volt rail. With the relay contacts as shown, the full -100 volts is applied to the grids of V3 and V4 thereby cutting them off. When the relay contacts change-over on "transmit" the operating biases appear at the grids, -18V for V3 and -35V for V4.

The receive converter used was a VK3 VHF Group 6 metre converter. This uses an MPF121 in the front end, and is most stable, producing good results. No modification to the oscillator stage was required to allow external oscillator injection. A small amount of the transverter oscillator injection is coupled off by L2. A length of co-ax feeds this straight into the crystal socket on the converter and the oscillator transistor simply operates as an emitter follower.

## ALIGNMENT:

Dip all coils to frequency with a GDO, then switch the transceiver to TX position. Adjust VR1 to give -18 volts on the grids of V3 and check V4 bias as -35 volts. This should produce about 60mA of cathode current in V4.

With an RF probe on the end of the co-ax from L2 adjust L1 for max and L3 for dip. With transceiver in tune position (full carrier or tone in) and absorption wavemeter near L4, peak L4 for max at 52MHz. L6 is then peaked in the same way. With a

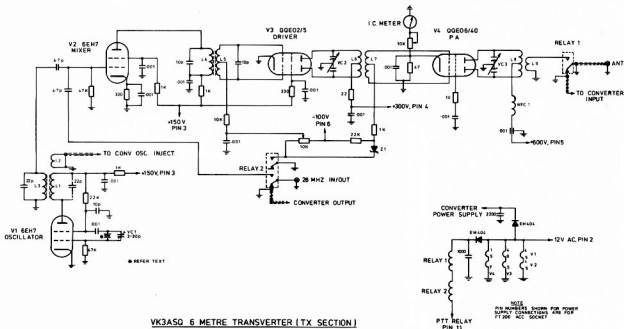
wattmeter connected to the antenna socket peak VC3, L8 and the coupling of L9 for max. Now re-peak and adjust coupling of all stages for max output. It may be necessary to reduce the carrier/tone level of the transceiver to avoid overdriving.





**A word of warning**—it is possible to tune the whole TX section up on the second harmonic of the oscillator i.e. 48MHz, if one is not careful. This is frowned upon as it could cause TVI to a certain TV channel! To avoid this, check each stage as it is tuned up, using the absorption wavemeter. Particular care should be taken with L4 and L5 tuning and coupling.

## DUAL BAND OPERATION:

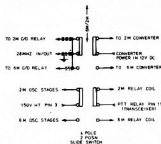
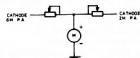
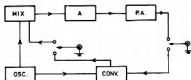
For dual band operation a 4 pole 2 position slide switch was mounted on the front panel. This was used to switch over the following connections: 12 volts to the receiving converters, 150 volts to the oscillator sections, 28MHz input-output and the transceiver PTT relay to either 6 or 2 metre relay coils. The converter outputs are wired in parallel. The 150 volts change over switch is also used to remove the 150V HT from the second half of the 12AT7 and the screen of the 12BY7 in the 2 metre oscillator section.

A common cathode current meter was used for both finals, with separate 10K trim-pots to each final cathode for meter calibration.



	<p>L1 - 14T 26B&amp;S CLOSE WOUND 5/16 IN. COIL FORM IN CAN, SLUG TUNED  L3 - AS FOR L1  L2 - 2T 26B&amp;S CLOSE WOUND 5/16 IN. COIL FORM IN CAN  L2 CONNECTED TO COAX LEAD &amp; BROUGHT OUT THROUGH SIDE OF CAN</p>
	<p>L4 - 10T 22B&amp;S CLOSE WOUND 5/16 IN. COIL FORM IN CAN, SLUG TUNED  L5 - 3+3T AS FOR L4  1/2 IN. SPACING BETWEEN</p>
	<p>L6 - 10T 20B&amp;S CLOSE WOUND 1/2 IN. DIAMETER  L7 - 3+3T AS FOR L6</p>
	<p>L8 - 4+4T 16B&amp;S 1 IN. DIAMETER SPACED 1 TURN  L9 - 3T 16B&amp;S 1 IN. DIAMETER WITH INSULATION</p>

COIL WINDING DETAILS



NOTE  
CONVERTER OUTPUTS WIRED IN PARALLEL

INTERCONNECTIONS FOR DUAL BAND  
TRANSMITTER OPERATION

# a 5/8 wavelength Mobile Antenna

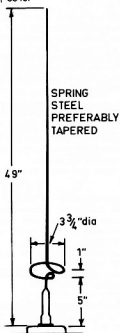
W. GEORGE FRANCIS, VK3ASV  
31 Donald Street,  
Morwell, 3840.

Here is an article showing a practical example of the 5/8 wave mobile aerial using a single turn bottom loaded coil suitable for 2 and 6 metre mobile net frequencies.

The original 5/8 wavelength mobile whip for the two metre FM net became popular around 1966 following an article in Amateur Radio, (1) which used a small base loaded multi-turn coil wound on a fibre glass rod or tubing which supported the vertical radiator in the form of a wire or braid, in turn covered over and protected by PVC tape or shrinkable plastic tubing.

The author studied mobile aerial design including research into overseas designs (2) extensively from 1954. During 1968 the idea of using a 5/8 wavelength mobile aerial with a subtle difference came to mind. The difference was in the base loading coil, which as in the original design tunes the aerial to .75 wavelength resonance.

It was felt this coil could act as a mechanical spring, should the aerial get knocked by a tree branch, service station roofs, etc. Stan VK3ZPL (3) experimented and developed such a prototype, superior to the simple 1/4-wave whip and equal in performance to the original 5/8 idea. This new arrangement was found also to have a very good match on 6 metres with near



STANDARD VHF MOBILE  
AERIAL BASE AND  
FERRULE

unity gain, acting as a base loaded 1/4 wavelength whip on that band.

Since the many Eastern Victorian and Melbourne amateurs have used this aerial with considerable success.

It is now commercially produced for U.S. amateurs. (4) For further technical information and polar diagrams refer to the recent article in Amateur Radio. (5)

The 5/8 whip can also be used with a ground plane on top of a tower and forms an excellent low angle base station aerial. (6).

## REFERENCES —

1. "5/8 Wavelength Vertical for Two" AR July 1964.
2. "Vehicular Advanced design gain Antenna", Cat. 251-508 Communication Product Co. U.S.A. 1969.
3. "5/8 Wavelength Whip for 164 & 174MHz", type RT, Associated Aerials Ltd., Kent, U.K., 1967.
4. now VK3BAB, G4BHN.
5. "6 and 2 metres antenna" Cat. No. 251-509.2.5db gain 2m., unity gain on 6 Phelps Dodge Communications Co. Advert. Page 12 CO, June, 1970.
6. AR September, 1970 "5/8 Wavelength Verticals" by WAGNOV also CO Magazine, May, 1970.
6. As used by VK3AJK, VK3BBB, VK3ADB & VK3ZUN

# Multi-channel Switching for the Vinten MTR 13

MORTON P. DAVIS, VK3ANG  
9 Hillingdon Court, Dingley, 3172.

Here is a concise step-by-step procedure for producing your own 6 channel Vinten MTR13, MK2.

Having firstly obtained the parts listed, and secondly arranged for a free Saturday afternoon, clear a spot on the work-bench and follow the procedure below.

**STEP 1—Re-location of Heat Sink on power supply side of chassis.**

- Unsolder leads to transistor.
- Remove under chassis components as necessary to gain access to the bolts holding Heat Sink.
- Remove Heat Sink.
- Drill and tap two new 5/32" diameter holes in the Heat Sink so that it may be relocated on the existing mounting bolts and moved to the side of the

chassis by 1/4".

e Mount Heat Sink in new location.

f Reconnect leads to transistor.

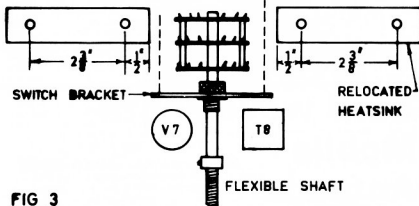
**STEP 2—Modification of Switch.**

- Replace 1/2" spacers with 1/4" spacers.
- Remove excess of holding bolts and flatten the shaft.

of each Heat Sink as shown in Fig. 3.  
b Mount half inch tapped insulated spacers at each of these four holes with a 1/4" 6BA bolt from underneath as shown in Fig. 4.

**STEP 7—Manufacture of bracket to hold trimmers.**

a Mark out two brackets as shown in Fig



**FIG 3**

- Do not reduce the length of the shaft at the front of the switch.

**STEP 3—Relocation of Switch Shaft.**

Locate flexible shaft so that the joiner lies between V13, V14, and V7, T8, as illustrated in Fig 10.

**STEP 4—Manufacture of Bracket to Hold Switch.**

- Only one bracket is required. Take the piece of aluminium sheet and mark out as shown in Fig 2.
- Cut out and file to size.
- Drill holes, cut notch and de-burr.
- Bend.

**STEP 5—Mounting of Switch.**

- Mount Switch on bracket and locate between Heat Sinks, with shaft in line with flexible shaft as close to V7, T8, as possible.
- Centre punch chassis as required to mount switch bracket.
- Remove under chassis components as necessary and drill two 1/8" diameter holes.
- Shorten switch shaft as necessary and join to flexible shaft.
- Mount bracket to chassis with 1/4" x 6BA bolts, or 1/8" Whitworth bolts.
- Replace under chassis components.
- Fit bush to front panel and fit knob.

**STEP 6—Modification to Heat Sinks.**

- Drill two 1/8" diameter holes in the top

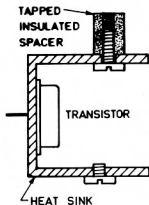
5. Note that some dimensions may require slight modification to suit particular crystal socket strips.

b Cut out and file to size.

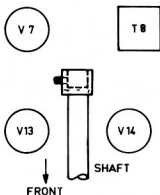
c Drill holes and de-burr.

**STEP 6—Mounting of crystals.**

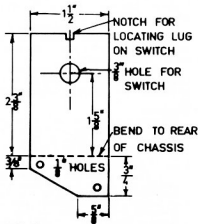
- Place bracket under socket strip with apron to front.
- Place both brackets on the spacers on the Heat Sinks.
- Fasten with 1/4" x 6BA bolts.



**FIG 4**



**FIG 1**



**FIG 2**

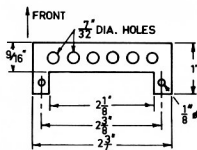


FIG 5

- d Check clearance. The top of the crystals should be no higher than the power transformer. If necessary reduce height of spacers.

#### STEP 9—Mounting of Trimmers.

- Remove socket strip and trimmer brackets.
- Mount trimmer to bracket taking care not to fracture the ceramic.
- Make sure trimmers are bolted on tightly.
- Check that trimmers are clear of Heat Sinks and transistor lugs.

#### STEP 10—Wiring of new components.

- Wire sockets to switch.
- Wire trimmers to sockets.
- Receiver wiring crystal oscillator V4, will be as for X1 and C33, 6 times.
- Remove X1 socket and C33 trimmer from chassis. Fit a tag strip underneath to connect wiring and components removed from X1 and C33.
- Wire transmitter carrier oscillator, V13. This is as for X2 and trimmer C80, repeated six times.
- Remove X2 socket and trimmer C80 from chassis.
- Fit a tag strip underneath to connect wiring and components removed from X2 and C80.

#### STEP 11—Mounting of Crystal Assembly

- Mount assembly on the Heat Sinks.
- Earth both trimmer brackets to chassis.

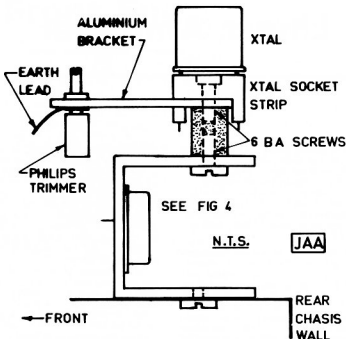


FIG 6 SIDE VIEW OF COMPLETED ASSEMBLY

#### STEP 12—Wiring of Channel Selector into Circuit.

- Connect switch to the tag strips as in 10D and F using the inner conductor of RG58 co-ax.
- Take these leads through the holes in the chassis that were occupied by X1 and X2 previously.

#### STEP 13—Alignment.

- Switch on your MTR13 MK2.
- Tune to frequency with trimmers.

#### PARTS REQUIRED

- 1 x Oak Switch MSP type F, AK 52267  
1 section, 2 pole, 6 position.

- 1 x 8" Flexible shaft with panel bush to suit 1/4" shaft.
- 2 x McMurdo Moulded Crystal Sockets—part number 998/P12/UG.
- 12 x Philips Ceramic Trimmers part number CO04EA/12E 3-12PF.
- 4 x 1/2" Insulated Plastic Spacers. tapped for 6BA screws.
- 4 x 6BA x 1/2" Bolts.
- 6 x 6BA, 1/4" Bolts.
- 2 x 6BA Nuts.
- 1 Piece of 16g aluminium for brackets, about four inches square.
- 2 x 3 Lug tag-strips.

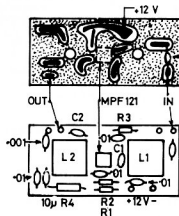
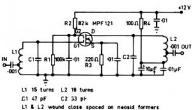
# Pre-amplifier for 28 MHz

Values are given for the 28MHz band; however, by changing L1 & L2 to resonate at the desired frequency, the pre-amp can be made to improve the performance of any receiver on any band.

Suggested layout of PC board is shown actual size.

(If 5% components are used, the G2 bias values given are satisfactory. However, if R2 is increased to 100k, then resistors with 20% tolerance could be used. R3 may need to be adjusted to give a coarse current of 5mA. Technical Ed.).

Reprint from GARC, Nov., 1972





# a Solid State Front End

I. W. COWAN, VK3ZDW  
31 Daly Road, Murrumbidgee, 3163.  
(Reprinted from the Victorian VHFer,  
July 1972.)

Every VHF operator needs a tuneable IF. Thanks to the many IC's available IF and audio sections are easy to build. The unit described here is a high performance front end for your favourite IF strip.

Shown in Fig 1 is the circuit of the front end unit which I use in my tuneable IF and which feeds a slightly modified EA240 solid state IF strip. The unit tunes 9.0-11.2MHz. Its image rejection is reasonable and the gain is sufficient to operate

the EA240 noise blanker from a WIA 2 metre FET converter.

Frequency coverage and dial linearity are dependent on oscillator circuit and tuning gang. The oscillator is a Colpitts type chosen for best stability and low "birdie" generation. However, this has a fairly large permanent shunt capacitance. To obtain a reasonably linear dial scale, a gang with a circular profile is used as a square-law gang would result in cramping at the low frequency end. The gang used is a high quality 3 gang double spaced unit which was available from a source in

Lonsdale Street, Melbourne. Its maximum capacity is around 15pf per section.

I spent some time fiddling with the oscillator to make sure it was free from drift, pulling, and "birdies". Oscillation is not violent, but it is completely reliable, and stability is quite good enough for easy SSB copy. The oscillator buffer serves two purposes—firstly, to permit an appropriate injection level to be set for the mixer, and secondly, to isolate the oscillator from the RF and mixer stages and prevent "pulling".

AGC is applied to the RF stage by means of a JFET in the source. I tried feeding AGC to the AGC gate but this was difficult using the negative-going AGC from the EA240 IF. The MPF102 works quite well in this application.

The front end unit is built up on a "U" shaped aluminium bracket. The oscillator is on one side, coils, gang and RF FET are in the centre, while the mixer is on the other side. The coils associated with the RF stage input and output are separated by a few inches and are mutually perpendicular. The RF FET is mounted directly on the gang and all by passing associated with this stage is returned to one point on the gang.

Tuned windings are all 25 turns of 30 B & S close wound on 5/16th slug-tuned formers. Primary windings have 2 turns and 5 turns for input and RF coils respectively.

Tune-up is simple. First the oscillator is set up for correct range. Then the RF stage slugs and trimmers are set for best tracking. The RF coils peak sharply, and tracking is quite good.

One final comment. MPF121 FET's make excellent amplifiers and mixers. However, they do not equal the old 6BA6-6BE6 combination for immunity to cross-modulation. A few db of attenuation which can be switched in ahead of the RF FET works wonders here.

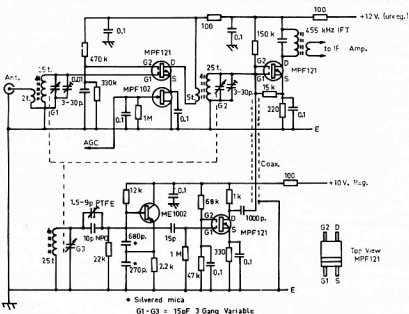


FIGURE 1. CIRCUIT DIAGRAM FOR TUNABLE FRONT END

# FM Discriminator Meter

Reprinted from GARC Newsletter, July, 1972.

This circuit can be connected at all times without any effect on the receiver audio. Almost any uA or mA meter will do. The 4.7 megohm resistor (R1) is of nominal value, and will be required to be altered to obtain a centre reading on the meter.

The meter used by the writer is a small tape recorder type of approx 250uA.

If necessary, adjust R2 so that not too much current is passed through the meter. A 9 volt (approx) zener diode is used to

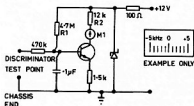
regulate the circuit.

Almost any NPN silicon transistor will work.

## SETTING UP

Check at discriminator test point on the carphone that the discriminator transformer is set correctly on frequency by the usual multimeter method.

Connect DC amplifier circuit and adjust R1 for centre reading on M1.



# Amateur Operators Certificate of Proficiency Examination

## February 1974

### TELEGRAPHY SECTION L (RECEIVING)

(Speed — 10 words per minute)

Gales lashed Bass Strait over the weekend with winds of 60 knots creating delays to some shipping of almost 12 hours. Passengers reported waves of nearly 25 feet washing over the bow of their ship. Seasoned sailors have said this 173 mile stretch of water between Tasmania and the mainland can

### SECTION L (SENDING)

Time allowed 2½ minutes

(Speed — 10 words per minute)

Most of the 249 passengers aboard one ship which arrived at her destination 13 hours late were showing the effects of about 25 sleepless hours

### SECTION K (Regulations)

Time allowed — 30 minutes

NOTE:—THREE questions only to be attempted. Credit will not be given for more than THREE answers. All questions carry equal marks.

- (a) Under what circumstances would the general call "CQ" be used?  
(b) Give an example of a telephony call using "CQ".
- (a) State the regulatory requirements regarding the inspection of amateur stations.  
(b) What documents should be made available for inspection at the amateur station?
- Describe the method of resuscitation you would give to a person who has suffered an

electric shock. Your answer should include the steps you would take before commencing resuscitation.

- Give the meaning of the following abbreviations:—  
QRA QSB? QRU QSA? AS

### SECTION M (Theory)

(Time allowed — 2½ hours)

NOTE:—SEVEN questions only to be attempted. Credit will not be given for more than SEVEN answers. All questions carry equal marks.

- (a) Draw the circuit diagram of an amateur station transmitter suitable for operation in the 144-148 MHz band. Explain briefly the theory of operation of each stage of the transmitter.  
(b) Describe how you would tune the transmitter described in (a).
- (a) Explain possible causes of interference to television receivers from amateur station transmitters.  
(b) Discuss with the aid of diagrams the technical precautions you would adopt to avoid interference from an amateur transmitter to television and broadcast receivers.
- With the aid of a circuit diagram, describe the operation of the "product detector" stage of a receiver designed for the reception of single-sideband suppressed-carrier radio-telephone signals.
- (a) Aided by a sketch or circuit diagram, describe an aerial system for use in the 7 MHz amateur band capable of correctly loading a mobile transmitter while in motion.  
(b) Indicate the areas in a motor vehicle from which noise may be radiated and picked up by the receiver. Suggest means of reducing or eliminating this radiation.

- (a) What are parasitic oscillations and how are they produced?  
(b) Why are parasitics undesirable in a transmitter?  
(c) Explain the methods you would adopt to locate and suppress them.
- (a) Discuss features you consider desirable in a microphone suitable for use at an amateur station.  
(b) With the aid of a sketch describe the construction and theory of operation of a microphone which you consider meets these requirements.
- With reference to the propagation of radio frequencies explain what is meant by the following terms:—  
(i) vertical polarisation,  
(ii) critical frequency,  
(iii) temperature inversion, and  
(iv) skip distance.
- (a) Assisted by a circuit diagram describe the operation of a Grid-Dip Oscillator or a Transistorised-Dip-Oscillator.  
(b) Indicate the reason for loosely coupling the oscillator described in (a) to the circuit being measured.
- (a) Explain the theory of operation of grid-leak bias when used in the final stage of a transmitter.  
(b) If the required bias is 45 volts, of which 18 volts is supplied by an external source, what grid current is necessary to provide this extra voltage if the grid resistor is 2,700 ohms?

# A Touch of History

## AMATEURS AND THE PACIFIC FLIERS Department Inquires Into Interference

Mystery surrounds the identity of the wireless station which last night interfered with 3LO when that station was picking up wireless messages from the Southern Cross plane.

It was stated that, when 3LO asked certain wireless amateurs and experimenters to cease interfering with signals coming from the plane, one station replied: "Go to hell".

Today the station manager for 3LO (Mr. Bearup) said that the interference was reported to him. On the other hand, well known amateur wireless operators, who listened in last night, deny that there was any interference.

The Postmaster-General's Department is conducting an inquiry, and the Chief Controller of Wireless Services (Mr. J. Malone), said that he hoped to be in possession of the full facts late this afternoon.

### "Interference Very Bad"

"When the interference was reported to me", Mr. Bearup said, "I got in touch with the PMG's Department, and with their concurrence made a request from 3LO for the interferers to cease. That was at 5.45 p.m., and when the amateur how to use his set, but of those causing interference by radiation, who, as they probably could not read Morse, were wasting their time.

"The interference was very bad from 8 to 8.45, and I made the first request at 8.15, repeating it several times later on. About 9.30 the interference eased considerably, and from then on we had no great trouble."

"It was reported to me that someone had sent the reply, 'Go to hell', but whether it came through the air or by telephone I do not know. Until I see the operator on duty last night our hands are tied."

### "Merely a Cloak"

The president of the Wireless Institute of Australia (Mr. Howard Love) said that he was listening in from 7 to 11 p.m. yesterday, and was not bothered by any interference. In his opinion, the attempt to blame transmitting amateurs and owners of oscillating receivers for interference was merely a cloak for the defectiveness of the receiver. Anyone who could not pick up KXAB (the Southern Cross), should have their receiver overhauled, for the signals were coming in perfectly all the time he was listening.

Mr. B. Hardie (secretary of the Institute) said that only at one period during his watch, from 8.30 p.m. last night, until 1 a.m. today, did he hear an amateur station operating close enough to the wavelength of KXAB to cause interference. That was at 5.45 p.m., and when the amateur was informed he shifted his length to 30 metres. KXAB operated on 33.3 metres.

One other transmitter was heard on the 33.3

metre wave — an American Navy ship sending greetings to KXAB and transmitting only during the times when the latter was off the air.

On several occasions, when important transmissions have been sent on the short-waves, amateurs were blamed for interference, but in this case the leading Australian amateurs were listening for the Southern Cross, and he was justified in backing their opinion that no amateur station was responsible for the interference.

### U.S.A. Stations Cut In

Mr. Jack Simms, of East Malvern, who has received practically all the messages from the Southern Cross, said that last night he heard no interference from local amateurs, although one earlier in the afternoon had to be told, and willingly obeyed, the instruction to shift off KXAB's wave-length.

He had, however, been interfered with by 6XJ and 2XAR, American commercial stations, the former at 5.5 p.m. yesterday cutting in and completely obliterating one long message from the plane.

Another well-known amateur, Mr. H. M. McCubbin, said that he had been told by a wireless operator from an overseas steamer that last night, when one local station was operating, it would have drowned messages from the plane.

Amateurs pointed out that the interference could have come from any station anywhere in the world.

Reprint, Melb. "Herald",  
June 5, 1928



# Newcomers Notebook

with Rodney Champness VK3UG

44 Rathmullen Rd., Boronia, Vic., 3155

**This month I have a correction for the February column, a method of reducing 6 metre interference to Channel 0 TV viewers, and some hints from VKSTL.**

## CORRECTION

I wouldn't be surprised if you had trouble understanding a small section of the first paragraph in column three, February issue, page 26. Portion of the paragraph was missed out and here is the correction for it. Look towards the bottom of the paragraph. The correction is as follows: **Incidentally this end of the resistor doesn't have to attach to the coil, it can go direct to earth. If the oscillator is not working check that voltage is being applied to pins 5 and 6 and that a voltage drop across the cathode resistor of up to about a volt is measured.** This should make this section easier to understand.

## SIX METRE AMATEURS AND CHANNEL 0 VIEWERS CAN CO-EXIST

Recently I spoke at length with John Patterson, VK3ATQ of Berwick on the problems that beset 6 metre amateurs in channel 0 viewing areas. John has suggested that a net channel be established in Victoria at the top end of 6 metres. It is understood that VK4s already have a net channel on 53.995 MHz, so it is suggested that a net be established in Victoria on this same frequency. Initially at least it would be an AM frequency but as time and techniques advance SSB may also become a common mode on this frequency. Crystal locked transmitters and receivers are thought to be the initial answer to the technical requirements on this frequency. A Yaesu FT-620 or a Midland 13-894 with transverter would make ideal units for this type of operation and are available, as far as I can tell, from a couple of our advertisers.

Some say this idea of going to the top end of the band will not reduce interference to television sets tuned to channel 0. With an average television set, or any ordinary radio for that matter, the principle of getting as far away from the frequency of the signal causing the trouble to reduce its effect is well known. The sensitivity of the television set at 52 MHz is perhaps 6 to 12 db greater than at 54 MHz when tuned to Channel 0.

Hopefully then, if you transmit somewhere near 54 MHz you can expect to be able to run 4 to 16 times as much power — 6 to 12 db — as at 52 MHz for the same amount of interference into TV sets. If you have no interference problems because you use low power, you could increase your power by the factors above without creating interference. It may hap-

pen though that the television sets concerned are being overloaded by your signals, whether you are at 52 or 54 MHz. In this case a trap will be necessary on the affected television set.

There is much that can be said about the 6 metre — channel 0 problem; much of it has been said before and there is, I believe, much still to come forward in the way of trap designs, technical standards for television sets, and education of the public. Further reading on this problem can be seen in this column for January 1973 and 1974.

I wholeheartedly endorse the move to 53.995 MHz as a new 6 metre net frequency. It is a positive step forward to reduce interference whilst still staying on 6 metres. Six metres is a fascinating band to operate on; it has most of the features of the HF bands and the interesting aspects of the higher VHF bands. I suggest that you contact John VK3ATQ if you want further information on this new network. Perhaps our VK4 friends can give us some idea on how well this move has worked for them!

## SOME HINTS AND COMMENTS FROM VKSTL

Tom suggests that an erinold knitting needle, size 3, which is about the same size as a 1/4 inch drill, would make an excellent extension shaft, and may well have advantages over a metal shaft as it is non metal and non conducting. It is cheaper but possibly would break more easily. Front panel bushes may be obtained from discarded potentiometers. The formers that plaster of paris bandages are wound on are suitable to make spacers from. Have you a friend in the medical

profession who could obtain these throw-away items? Another useful plastic strip is the one that artificial teeth are supplied to Dentists on. They are about 2 1/2 inches long.

The octopus straps, as used to hold surf boards on roof racks, etc., make good straps for holding down mobile gear. Tom uses a set of the shorter ones to hold his 6 metre equipment down. I assume that the equipment is held down on the seat, Tom doesn't make this point clear. It is a very good idea, however, as sharp cornered amateur transceivers would not be fun flying around in a car unfortunate enough to be involved in an accident.

Some time in the past Tom had a 22 set which is very similar to the 122. Tom's comments are sparked off by my article on getting rid of chirps from the 122, which was in February's issue. On the particular set Tom owned the 300uF 16 volt capacitors were defective. I would suggest additionally that all electrolytics in the set and its power supply be checked. With these defective Tom was getting a "chirp" of 4kHz. You may well have to do both modifications if you own a 22 or 122.

Thank you very much indeed Tom for your comments and ideas, I am sure others will find them of value. Supposedly the comments on the 22-122 should not appear in this column, however, knowing how to spot faults in your equipment is part of becoming proficient in electronics. The question now is why should a faulty electrolytic cause extremely bad chirp on a CW signal? That is something for you to figure out. If you want to know, write to me and I will discuss it in this column.

## Try This

with Ron Cook VK3AFW  
and Bill Rice VK3ABP

### "A QSO FILING SYSTEM"

I have received many "on air" requests for information on the filing system used at my QTH. It was suggested a short article on my system may be of interest to other members.

The cards I use are standard office stationery lined cards, and measure 6

inches by 4 inches. They are laid out as shown in the diagram, and are filed alphabetically by prefix and call-sign.

One advantage of such a system is that a quick check through the cards can reveal a particular operator who has built, or is using some piece of equipment that you are interested in. Once identified, it only takes a short note through the mail to the operator of the station to enquire or obtain a circuit etc. I have found this filing system useful already in this regard, and a quick check through the cards reveals just how popular the FT200 and tri-band beams really are!

CALLSIGN OF STATION WORKED OPERATORS NAME QTH OF STATION

VKSJE	JOHN	POORAKA S.A.
217	8/9/70	FT200
1049	4/11/73	TRAP DIPOLE
		BUILDING LINEAR

EQUIPMENT USED

NOTES

ASK HOW LINEAR TURNED OUT QSL SENT REC.

QSL INFORMATION

## Commercial Kinks

with Ron Fisher VK3OM

3 Fairview Ave., Glen Waverley, 3150

This month a few notes on the Heathkit transceivers SB100 and SB101. Although not as common as many of the Japanese transceivers, these rigs are usually highly prized by their owners and in general command a relatively high price on the second hand market.

The first of the series, the SB100, was first released in late 1965, and in common with the other Heath 'SB' gear released a few months before, featured a new quality in kit type gear. It seems that perhaps Heath looked closely at the Collins range and borrowed a few of their outstanding features. The SB101 followed in 1968 and now had provision for an optional CW filter. The still current SB102 is identical in all respects except that the VFO is now transistorised and the receiver front end has been slightly hotbed up. Apart from the VFO, the first SB100s can be up-dated to the latest specifications.

For SB100 owners here are the simple modifications to update to a 101. Change the following components:

- R221 from 470 to 100 ohms.
- R927 from 220 to 100 ohms.
- R928 from 150 to 56 ohms.
- R104 from 47 to 56 ohms.
- R105 from 47 to 56 ohms.

Insert a 4700 ohm 1 watt resistor between ground and the ground end of the 10K BIAS ADJUST potentiometer.

Connect a 0.005 disc ceramic capacitor from the B+ connection to the LMO to ground.

If you are using a home made power supply for your 100 to 101 make sure that the 300 volt supply is right up to the mark. In fact it is better to be a little on the high side and up to 325 volts is recommended. The higher voltage will improve both receiver gain and transmitter output. If the receiver audio output appears a bit low, gain in this section can be increased considerably by removing C928, a 0.05 negative feed back capacitor between pin 7 of V14b and the audio output transformer T301. Now add a 100 mfd electrolytic capacitor (25 volt) from pin 7 of V14b to a convenient ground point.

Receiver gain and signal to noise ratio was improved in the SB102 by changing the RF stage tube to a 6HS6. This tube does not seem to be obtainable in Australia, however the 6AH6 appears to have almost identical characteristics and is in stock at most dealers. I have also found that substituting a 6AH6 for the 6AU6 first receiver mixer gives a very worthwhile gain improvement.

One problem that seems to crop up with most of these transceivers is the inability to zero the 'S' meter. Heath made the following suggestions. "Very likely the meter problem could be caused by a defective tube at V3 or over injection from the heterodyne oscillator into the mixer stage. We suggest that you reduce your heterodyne oscillator injection as a possible corrective measure".

Look into the above as a first resort, but in many cases it has been necessary to replace resistors associated with the 'S' meter circuitry with high stability components.

If you wish to add the CW filter switching to the SB100 a kit is available from Heath to do the job. However, as the normal SSB filter has to be replaced with one of smaller physical size, the price is rather higher than might be thought. The kit has a Heath part number of SBA-100-2.

Low mike gain is another common complaint. The first way to overcome this is to use a high output microphone. The very cheap lapel type crystal microphones appear to be a good choice.

It may also be possible to increase the gain of the microphone pre-amp stage V1a. If both R1 and R2 were increased in value to 470K and 1M ohms respectively a worthwhile increase in gain should result.

Many of the modifications discussed above may also apply to the Heath HW100 series as all circuit boards of this model are common with the SB101.

Next month it's back to two meter FM with a regulated power supply for your solid state transmitter.

## Magazine Index

With Syd Clark, VK3ASC

As you can imagine, due to the uncertainties of mails the work load varies somewhat from month to month. For this month our load is quite light with only four magazines to be mentioned in our index. A number of foreign language magazines come to the Institute and although some of these sometimes contain material worthy of mention, translations, especially technical translations, are not easy to come by.

### QJ February 1974

The Low profile Quad Antenna: Radio Communications in Primitive New Guinea; Results of the 1973 QJ World Wide WPX SSB Contest; Ten-Tec Model 315 Receiver (Review); Oscar News and Orbital Data; SSTV.

### HAM Radio: October 1973

Electronic Keyer with Memory; Audio-shift RTTY Keyer; Touch-Tone Decoder; Two-band Antenna Matching; RF Power Meter; Advanced VHF Pre-selector; Half Wave Rectifiers; Frequency Measurement of Received Signals; Electronic Bandpass Tuning.

### RADIO 25: January 1974

Workers of the World Ignite! VHF Repeater Aerial System; Quartz Crystal & Frequency Standards; Mobile BRRR... to mobile PFFF...

### RADIO COMMUNICATIONS: February 1974

Top Band Conversion for the KW Vicinity 111A; The S-Square. A new VHF & UHF Aerial; A Digital Morse Code Generator; Technical Topics: this month's space is devoted to new approaches to AM reception; a cunning RF wattmeter; Japanese Component Markings and High Pass Filters.

## Letters to the Editor

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the Publishers.

Editor,  
Dear Sir,

### GO NIPPON

In addition to the Hitachi books on the Japanese language mentioned by VK5RB in the March 1974 issue of Amateur Radio, there is another source of instruction readily available to the amateur fraternity.

Radio Japan broadcasts a weekly 15-minute session for beginners called 'Let's Learn Japanese' and one for more advanced students called 'Let's Practice Japanese'.

Frequencies used for these broadcasts are subject to change throughout the year, but up until at least May 4, 1974 the schedule is as follows:

Let's Learn Japanese			
Service	Day	Time GMT	Frequency MHz
Aust. & N.Z.	Tue.	1005-1019	15.235
	Tue.	1005-1019	11.875
General	Tue.	1015-1029	15.195
		1415-1429	11.815
		2315-2329	15.195

Let's Practice Japanese			
Service	Day	Time GMT	Frequency MHz
Aust. & N.Z.	Thu.	1005-1019	15.235
		1005-1019	11.875

'Let's Learn Japanese' consists of a full year's course and will be re-commencing in April 1974. A text book covering all of the lessons is available free from Radio Japan on request to:

Nippon Hoso Kyokai  
Tokyo  
Japan.

A. B. Holleben,  
VK6EQ.

## Intruder Watch

with Alf Chandler VK3LC

1536 High Street, Glen Iris, 3146

By the time this is in print I shall be in Japan. The XYL and self sail in the "Marco Polo" for a six-week cruise around the Orient on April 17th returning in June. I hope to contact some Amateurs interested in the Intruder Watch in Japan. Hong Kong and Singapore and will be plugging for co-operation from them.

As I have not had the co-operation desired with the 3.5 MHz IW skeds month I am discontinuing them, and instead substituting individual skeds. So far I contact VK4KX on 14180 kHz at 2330 GMT on Thursdays our date, and with VK6DA on 14130 kHz at 0030 GMT on Sundays. I hope other states will co-operate. With the departure of our VK2 co-ordinator, Bill VK2ZQ for a stint in Nauru, a vacancy has been created in that state. I do hope some enthusiastic member will fill the gap. We do need enthusiasm.

A recent report by several VK6's of a spurious signal from Voice of America (Philippines) in the 14 MHz band, and relayed by me to my friend in the U.S. caused quite a stir there. I don't think we shall hear any more spurious signals from that source.

An interesting, though disquieting, fact can be ascertained by rereading pages 83 to 86 in the publication by Wireless World, London "Guide to Broadcasting Stations, 17th Edition". From 7000 kHz to 7150 kHz there are 153 Broadcasting stations listed, and they are by no means all from Britain or Communist China stations. Food for thought, eh?

On my return I shall give you an account of what transpired between myself and the various Amateurs I was fortunate to meet.

# VHF UHF

## an expanding world

with Eric Jamieson VK5LP

Forreston, S.A., 5233  
Times: GMT

### AMATEUR BAND BEACONS

VK0	VK0RSG, Macquarie Island	52.160
	VK0MA, Mawson	53.100
	VK0SE, Casey	53.200
VK1	VK1RTA, Canberra, x	144.475
VK2	VK2W1, Sydney	52.450
	VK2W1, Sydney x	144.002
VK3	VK3RTG, Vermont	144.700
VK4	VK4W1/2, Townsville	52.600
	VK4W1/1, Mt. Mowbullan	144.400
VK5	VK5VF, Mt. Lofy	53.000
	VK5V1, Mt. Lofy	144.800
VK6	VK6RTV, Perth x	52.300
	VK6RTU, Kalgoorlie	52.350
	VK6RTT, Carnarvon	52.800
	VK6RTW, Albany	144.500
VK7	VK7RTX, Devonport	144.900
VK8	VK8VF, Darwin	52.200
VK9	VK9GA, Goroka x	52.001
ZL1	ZL1VHF, Auckland	145.100
ZL2	ZL2VHF, Wellington	145.200
	ZL2VHF, Palmerston North	145.250
ZL3	ZL3VHF, Christchurch	145.300
ZL4	ZL4VHF, Dunedin	145.400
JA	JA11GY, Tokyo	52.500

x — denotes change

At LAST. The great news has been received. The beacon licence for VK1 has been approved, and steps are being taken to erect same in its final position. Power output 18 watts, nominal frequency 144.475 MHz and identification is FSK (F) Morse code, call sign VK1RTA. The initial antenna was a vertical aimed on Sydney. It is hoped the antenna will be more versatile than that in the final set-up, as VK1 is not a very common distance even from VK5, and certainly possible to VK3. Anyway, congratulations to the boys in Canberra, and we all hope the installation of your beacon will bring rich rewards in VHF DX contacts.

Roger, VK2ZRH, writes with news of the VK2 beacons, advising they were positional from 5/1/77, on 144.450 and 144.600 MHz. Due to interference from various FM units having a crystal frequency in VK2 at that position, and also interference from the VK2 repeater, which is at the same QTH, the 2 metre beacon was shifted to 144.002 MHz on 20/1/77.

The beacons are completely solid state, and produce about 30w output on both bands. The antenna on 6 metres consists of crossed dipoles stacked five-eighths wavelength apart at a height of 50 feet. Two metres consists of two 12 element arrays — one bearing magnetic north, and the other on Geelong/Victoria. Average height of the 2 metre array is 39 feet.

The identification is VK2W1 at approx. 10 wpm at intervals of 40 seconds, with continuous carrier for the remaining period. The beacon on 6 metres has been heard in most States and ZL, while the 2 metre beacon has been heard in VK1, VK3, VK2 (Boggabri and Tamworth — about 250 miles) and in ZL3 during February.

Roger would be pleased to receive any reports of either beacon, the address being: The Beacon Committee, C/- VWA, 14 Atchison Street, Grows Nest, NSW 2065. Roger will be operating the Beacon.

While still on beacons, Wally VK5ZWW advises that the VK6 beacon on 6 metres in Perth is off the air, and that a new one is being tested on 52.3 MHz with the call sign VK6RTV. The Perth beacon remains listed, but under the new call and frequency, it may well be operated by the time you read this; if it's not, then when you do hear it you will know what it is!

Not sure of the position of the former VK9 beacon at Goroka, PNG. With the change of administration in this area, it may probably have a new call sign at any rate, but it is listed this time and you should bear in mind changes are likely with this one.

With the installation of the beacons in Sydney

and Canberra we can now say truly that all States are represented with beacons, either on 6 or 2 metres, on one way or the other, or with the aid of various repeaters and other FM stations. Australia is now well provided for when the DX comes through. Surely now there will be few lost opportunities — somebody must hear the long distance station and set the ball rolling even if in his own area only.

### SIX METRES DX

Wally VK5ZWW reports some interesting activities on 6 metres during March. On 9/3 at 2005 VK0W1 heard in Adelaide at S3 with QSB. At the same time heard in Albany WA at S9. No ZL or VK TV or any other activity at the time. 23/3, 1530 to 1730 on 6 metres, 6 and 7 worked in Adelaide up to S9 with usual QSB. Quite a lot of activity on 50 MHz. Wally heard a beacon on S0.5, but as there are a number of such stations operating on that frequency, no positive identification could be made. 24/3, 1500 to 1530, JA 3, 5, 6 and 9, s'gna's peaking to S8. At 1800 the band opened to Kalgoorlie, Perth, and Albany at the same strength for over 2 hours. 25/3, 1850, band opened to Sydney for 2 hours, signals to S9. 30/3, 1200, strong opening to Lindsay, VK4ZIM, Rockhampton, who reported he worked JA 3 on 24/3. Also on 25/3 at 1030 to 1045 minutes opening to JA 2 and 3. Thank you Wally for the info.

I suppose somebody's loss is another's gain, but in we VKs are surely going to miss Wally, VK5ZWW when he shifts to Orange in NSW in May of this year. With him will go the big beams, H1's powered rigs, and one person who could be relied upon to be on the band when something happened. Wally did much to foster interest in meteor scatter circuits, and one marvelled at his ability to read weak signals through all the QRM from the busy road just outside his front fence. He is a valued member of the WIA and the leading light in the VK6 Contest Committee. I am glad in VK5 and other places where you have been heard (there couldn't be many where you haven't!) will join with me in wishing Wally, his XYL Dorothy and family a successful new venture. See that you look after him you VK2ers.

### OSCAR

This page does not usually become involved in these things, being left to the special articles appearing from time to time, but I would like to reprint the following from the March issue of "Forward Bias", the journal of the VK1 WIA Division. I think it is advisable for all areas to know the type of work that is being done on in some places. I'll leave you to draw your own conclusions. I quote: "Oscar 7 will have a 5 watt output transactor between 145 and 29 MHz. Excited by the prospect of some real technical work, the Sydney boys are talking of building converters to convert the Oscar 7 signal on 29.4 up to 145.3 so that they can work the satellite, using the channel 4 repeater! That way, they transmit on 146.4, the repeater retransmits on 145.9, this thumping great signal blocks up the entire satellite and produces a large signal on 29.4 which they then reconvert to 145.3 to receive on their FM receiver. All this, you say, is the official WIA policy is to clear the satellite band so that repeaters do not interfere? Yes, but remember, democracy is only OK if it works your way. The Sydney chaps are now talking about a South Sydney repeater. The frequency? OLD channel 2 or 3. Groan." End of quotation, my comment: "Oh Boy!"

### 432 MHz MOONBOUNCE

The Illawarra Branch of the WIA continue with their moonbounce activities and the following report is made.

"EME tests were made on February 2nd, 3rd and 9th. Weak signals were heard from WEFJZ on the 2nd and he indicated that he was copying us reasonably well. Nothing was heard on the other two tests except our own echoes, which were up to 8 dB above noise on 9/2/74.

The test on last night was on 2/3. It was known to be a little late in the night for WEFJZ but K2UYH is willing to operate at any hour of the night. WEFB8G was also notified of this test as it is known he passes such information to a number of other stations who operate EME.

An attempt was made to work K2UYH which lasted for the full hour. His signals peaked to 10 dB or more above noise. He was also receiving VK2AMW very well. We were intrigued at the

variation in his frequency at the end of his transmissions, but it is now thought that he was shifting carrier to demonstrate ability to use RTTY when he obtains a teletype machine. He suggested during the test that we try RTTY next month.

This EME test produced results far better than anything achieved previously, mainly as a result of the other station having a 2m beam (28 feet diameter) and possibly assisted by the use of linear polarisation both ends, though results may have been even better (less fading) if we had both been circularly polarised.

Much of the information received was put on tape and some on the chart recorder. Our echoes were up to 8dB above noise. VK2ZEH was the only station to grow into CWI. The next test will probably be on 30th or 31st of March. There are now approx. 10 stations on 432 MHz EME in USA and arrangements are being made to schedule a larger group on our tests than in the past.

The latest letter from OEGAP in Austria indicates he hopes to be ready for EME tests within 6 months."

### GENERAL

I note that this year is the 10th anniversary of the South East Radio Group Convention in Mt. Gambier, and planning is well under way. This year the VK3 and VK5 holidays coincide so this should pave the way for a good attendance on 15th, 16th and 17th June.

One cannot but help being a little wishful in his thinking of times gone by when one reads the comment in the SERG journal "Blurb" that "There was little activity from Mt. Gambier during the last DX season on 6 metres . . . I guess it is the inevitable result of many of the former licensed operators gaining their full calls and migrating to the HF bands for easy contacts. Probably the same situation exists on 2 metres to a degree. With the ready availability of good HF transceivers it is now so easy for anyone anywhere to join the chaps on HF, but always assured of a contact.

One year of hope for the 6 and 2 metre bands in particular seems to lie in the fact that there is now available on the market a transceiver designed especially for 6 metres, and the promise of a similar machine for 2 metres soon. Although low power devices, they can be readily brought up to reasonable power with a linear aid, as such, providing a good means of QSB on VHF, being even easier than the traditional transverters now in use.

The Geelong Amateur Radio & TV Club will be holding their fifth HAMFEST on the weekend of 11th and 12th May. The first such function was held in 1970 with 90 attending, last year 240 were present. There is entertainment on the Saturday, and field events on the Sunday, with things for the XYL's, YL's and harmonics to do. This column wishes the Geelong boys a very successful weekend.

There's about all the news for this month. Don't forget to keep an ear to the ground for a sorry transceiver — for that winter DX which could pop up on 6 and 2 metres during the cold months. Just turn up the shack oil heater a little, and listen on the bands between your own calls.

My thanks with the thought for the month: "The most important person to listen to is oneself, and the most important task is to develop an ear that can really hear what we are saying."

The Voice in the Hills.

## QSP

He who hesitates is known as QRM. ARNS Jan. '74. Amateur Radio is like war. Easy to begin, hard to stop. Adaption from ARNS Jan. '74.

### 2m DX VIA BALLOONS

This is the heading of an article in Radio 2S, Feb. '74, which states "Inspired by the spectacular successes of Radio Amateur groups in Europe — DL, OH, I, etc. — we are planning to launch a series of airborne 2m beacon-transmitters and repeaters in the near future in South Africa." . . . These weather balloons can reach a height of 25-30 km and flight time would be about one to four hours.

### ANOTHER LOSS

IARU Region I advise that in France the hitherto exclusive amateur band of 144 to 146 MHz is to be shared with military stations. Rad. Comms. Mar. '74.

# Contests

with Peter Brown VK4PJ

Federal Contests Manager, G.P.O. Box, 638  
Brisbane, Qld., 4001.

## A FEW GENERAL NOTES ON THE CONTEST

Reports tell me that the contest was friendly and of course most enjoyable. A few home stations mentioned that they will be in the contest next year.

## BUT DID WE HAVE A NARROW ESCAPE?

We went forward by but 1.4 per cent or if you wish ONE log. 70 logs this year, 69 last year. Fortunately we are up one log in field stations. Some of those missing field station logs would have given us a marked improvement.

It is good to note that multiple op stations are up.

Thanks for all the comments and letters . . . every one of interest. I'll tidy up the rules and next year will be another great get together.

## CONTEST CALENDAR

May 11th: World Telecommunication Contest CW  
May 11th: YL ISSBS QSO party CW  
May 18th: World Telecom Contest Phone  
May 18th: YL ISSBS QSO party  
May 31st - June 3rd: CHC/FHC/HTN QSO party  
June 15th-16th: All Asian phone Contest.

## AUGUST REMEMBRANCE DAY CONTEST

THE FRIENDLY CONTEST. Make it the greatest yet. 800 logs. We'll make it . . . if you send in your log, and get someone else, who has been missing out, to join us. Date in next month's Amateur Radio CQ CONTEST.

As I write this the contest is in full swing. At the times I was on, 15 metres was the only band of interest . . . Some QSB on the Ws and Ks and the JAs were starting to come in . . . I may get a chance later.

Did you know that Martin VK4VU, a great contest man, came fourth in the world in the year's QSO SSB contest. Congratulations.

## YL ISSBS QSO PARTY

CW 0001 GMT to 2400 GMT May 11th.  
phone, 0200-0400 GMT Sunday, May 18th.  
CW 24 hrs, one 6 hour rest period.  
phone, 48 hours, two 6 hour rest periods.  
Rules are lengthy and are available from W7EOI . . . but you can join in.

Frequencies: CW 3565, 7085, 14070, 21070.  
phone, 3573, 7273, 14333, 21373, 28673.

## DX ON 3775 AND 7080

Logs to L. W. Coleman, W7EOI, 412-19th Street, SW Great Falls, Montana, 59404.

## WORLD TELECOMMUNICATION CONTEST

CW 0001-2400 GMT Saturday, May 11th.  
phone, 0200-0400 GMT Sunday, May 18th.  
Single op stations 160 through 10 metres.

## Exchange: RS/RST plus ITU zone.

Scoring	10/15/20	40	80/160
Same country	0	0	0
Other countries, same zone	1	1	2
Other zones, same continent	2	3	4
Other continents	3	5	6

Final score: Total QSO points X different ITU zones worked.

Same station may be worked each band for QSO points but zone counted only once.

Log entries in order . . . Time GMT, station worked, exchange SAR, band, continent, zone, QSO points.

Awards: Diplomas to the three highest scoring stations in each country. Separate awards for CW and phone.

Mail logs before June 30th to: Ministério das Comunicações, DENTAL, 70000 Brasília, DF, Brazil.

## SOME NOTES ABOUT RD COMMENTS RECEIVED

Again thanks for all the comments . . . especially those on rules. By the time you have read this, Federal Council will have appointed a new Federal Contest Manager because I have completed the three year term planned. However your aforementioned comments will be passed to him . . . and the corrections made.

# 1974 JOHN MOYLE MEMORIAL NATIONAL FIELD DAY RESULTS

## 24 HOUR DIVISION

Section (a) Tx phone

VK3AUQ	1162
3BMA	340
VK4IE	2375
4AL	1435

Section (b) TX CW

VK3ANU	1154
VK3JI	672

Section (c) Tx Open

VK2RJ	1686
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Section (d) Tx Multiple Open

VK1ACA	6288	12 ops
1WI	4680	6 ops
2WG	2334	9 ops
3APC	5742	13 ops
3ATL	5397	8 ops
VK3ATM	5101	9 ops
3AWS	2736	8 ops
3KK	835	4 ops
4WIT	2731	19 ops
8DA	2619	8 ops

Section (d) Tx Multiple phone

VK3ANR	703	2 ops
5LW	1989	9 ops
VK9XI	625	3 ops

Section (e) Tx VHF

VK2YAV	626
2YBT	518
2ZCT	442
VK3AVJ	619
3YAP	516

Section (f) Tx Home Station

Section (f) Home Station

VK3RX	330
3AYL	975
3CM	730
3RN	650
VK3ZML	530
3VF	405
3ZT	850
5DL	210

Section (g) Receiving

K. D. Cunningham 650

650

## 6 HOUR DIVISION

Section (a) Tx phone

VK1JG	320
3BBC	840
3EF	847
3DY	537
3HE	425
3ZA	356
VK3SS	210
4GT	877
4PJ	246
5BW	814
7AX	560
7BM	200

Section (b) Tx CW

VK2YB	324
2JM	216
VK3TX	255

Section (c) Tx Open

Nil.

Section (d) Tx Multiple

VK3JH	913	3 ops
3BDO	834	3 ops
VK3WIA	338	7 ops

Section (e) Tx VHF

VK3PN	272
3ZAE	34
VK5BW	54

Section (f) Home Station

VK2ZA	250
2CW	check
3QK	845
3RA	215
VK3EM	40
3AJB	check
4UJ	225
4LM	555
5DV	435

Section (g) Receiving

S. Gillespie	1600
P. J. Hall	710
A. J. Everett	1003
E. Trebilcock	390
J. H. Zinkler	CW log check

Most portable stations thanked the home stations for taking an interest. Signals were surprisingly strong from most stations, apparently their location was carefully selected. Hope to be in the field next year.

John VK3JH mentions "This year we took a young and enthusiastic group of SWLs with us and had a tremendous day . . . if next year is still half as good it will still be a great day".

Paul VK3ZML scored 530 points on one VHF channel.

VK3AWS has a 5 kVA alternator to keep 6 Txs and 8 ops going.

"Thoroughly enjoyed by all".

VK3ATM on a 60 ft fire tower with a 10KVA diesel . . . (at the foot).

VK3APC worked 9 bands including 435 and 1296 MHz and had 2 x 3KVA and one only 1KVA alternator.

VK3WG used a 5 kVA alternator and listed every contact's name.

Anthony VK2ZT used a 3 phase alternator mounted on a trailer.

VK1ACA with 6 HF Txs and 4 VHF Txs had a portable tower and a 15KVA alternator.

VK1WI was 5782 ft up on Mt GININI.

There are many more comments but the mail closes soon. Don't miss next year.

## JOHN MOYLE MEMORIAL NATIONAL FIELD DAY RESULTS

Two more logs have been received.

24 hour Section (a) Tx phone

VK3SR 1803

6 hour Section (e) Tx VHF

VK3ZFI 34

So now we have 3 logs more than last year.

## TOWNSVILLE PACIFIC FESTIVAL CONTEST 1974

(BIENNIAL)

The aim of the contest is to foster an interest in the Townsville Pacific Festival, and to increase interest and activity on all Amateur Bands by Australian Amateurs.

It will be noted that a further effort is made in this contest to increase popularity of the CW mode of communication. Hence CW contacts count for double score.

This year will be the first Townsville Pacific Festival Contest (I hope the first of many). I trust that all will find it as interesting and enjoyable as other contests.

73's es good luck

Ray Kearney, VK4HE

Queensland Contest Manager

### 1 TIME OF CONTEST

The Contest will be of 24 hours duration 0900 GMT Saturday 8-6-74 to 0900 GMT Sunday 9-6-74.

### 2 SECTIONS

A Transmitting all bands phone only.

B Transmitting all bands CW only.

C Transmitting all bands. Open.

D Receiving all bands. Open.

### 3 CONTACTS

(a) CW contacts count as double score (CW to CW).

(b) 1 contact per band only.

(c) No cross band contacts.

### 4 AWARDS

1 A Certificate will be awarded to each entrant who submits a log.

2 A Certificate will be awarded to the highest scorer in each section for each call area.

3 The entrant with the highest overall score will

be awarded a Certificate.

4 A trophy will be awarded to the entrant with the highest total score. The trophy will be held until the next contest (i.e. two years).

### SCORING

#### Bonus

(a) for contact with VK4WIT 15 points to be added to score on table below

(b) for contact with any other Townsville station 9 points to be added to score on table below.

N.B.—VK4WIT and other Townsville stations are the only VK4 stations that other VK4 stations can contact. Scoring for VK4WIT and other Townsville stations will be the same as for other VK4 stations. However VK4WIT and Townsville stations receive no bonus points.

### CONTACT POINTS as per table below —

	VK1	VK2	VK3	VK4	VK5	VK6	VK7	VK8	VK9	VK0
VK0	6	6	6	6	6	6	6	6	6	6
VK1	—	1	1	2	3	6	2	4	5	6
VK2	1	—	2	1	2	6	3	4	5	6
VK3	1	2	—	3	2	4	1	6	5	6
VK4	2	1	3	*	4	6	5	2	1	6
VK5	3	2	2	4	—	1	5	1	6	6
VK6	6	6	4	6	1	—	4	1	2	6
VK7	2	3	1	5	5	4	—	6	5	6
VK8	4	4	6	2	1	6	—	2	6	6
VK9	5	5	5	1	1	2	5	2	—	6

\* Queensland stations may work VK4WIT and other Townsville stations.

that two or three IRCs be sent to help defray expenses. The address for application is:

QSL Manager,

Post Box 6888,

Beirut, Lebanon.

Requirement: Contact is required with ten different QDS stations.

## Y.R.S. with Bob Guthberlet

Methodist Manse, Kadina S.A., 5554

With the seasonal break ended, clubs will have commenced activities again, and we look forward to another year of increased activity and service to youth. Within a few weeks, definite plans will be made for the Conference to be held at Maitland, NSW during the period August 31st and September 1st, 1974.

I have to announce the resignation of Mr. Rex Black, VK2YA, as Chairman of the Standardisation Committee, as required by the last meeting of the Council. Mr. Black has rendered noteworthy assistance to the Scheme of which he is the Founder, and his influence and service will be duly recorded. The report of the committee will be presented to the forthcoming Conference.

An interesting letter received from Mr. T. A. Grunsell, Acting Principal of the North Rocks Central School for Blind Children, makes inquiry regarding the possibility of YRCS giving assistance to blind people, enabling them, through the media of Amateur Radio to have contact with others more fortunate, and also to afford a hobby activity which could open up for them a whole new world. In answer to this appeal, the Maitland Radio Club will investigate the possibility of sending tape recordings to the school, and helping to assist these people. The day may come when YRCS will have lessons in braille for the instruction of the blind.

During the past few months new State Supervisors have been appointed, and there appears to be a serious problem over records not being available. Will all supervisors please keep accurate records of clubs, members, etc. etc. so that same can be handed to successors.

Details of the Novice Licence are not to hand, but we anticipate that we are met at Maitland, we shall have definite information for discussion.

In the meantime, be enthusiastic about YRCS. Talk about it; work for it, and above all, do not lose your sense of humour!

\*Queensland stations may work VK4WIT and other Townsville stations.

### SCORING FOR VHF and UHF

Same as for H.F., except that on bands above 50 MHz (i.e. intrastate contacts are permitted). For this purpose, a contact on frequencies above 50 MHz within an entrant's own call area will score 1 contact point. With the exception of VK4 where the Bonus rule applies for contact with VK4WIT or other Townsville stations.

### CONTACTS ON 160 METRES

Same scoring as in table with additional 5 bonus points per contact.

### SEND LOGS TO:

Townsville Pacific Festival Contest,

P.O. Box 964,

TOWNSVILLE, Q'd. 4810

CLOSING DATE FOR ENTRIES

31st July 1974.

## Awards Column

with BRIAN AUSTIN VK5CA  
P.O. Box 7A, Crafters, SA, 5152.

### Townsville Pacific Festival Award 1974

A certificate will be awarded to those amateurs who work VK4WIT (Townsville Amateur Radio Club Station) on either a HF or VHF band.

The award is available only during the Pacific Festival, which is to be held 7th June 1974 to 17th June 1974 inclusive. Open to all licensed amateurs and SWLs, Australian and overseas.

Endorsements will be made for a particular band or mode where applicable.

VK4WIT will be operating for the duration of the Festival. Other Townsville stations will be operating on all bands during the period of the Festival. The Townsville Club Net operates every Sunday on 3600 kHz at 0945 GMT.

Send applications to PO Box 964, Townsville, together with a list of the stations worked.

### WAZP Award

The award is available to licensed amateurs. Contacts on and after 15th May 1972 are valid. Do not send QSL cards. A list showing full details of the contacts should be certified by the Awards Manager.

There are no band or mode restrictions. The fee for the award is five IRCs. The address for application is:

Radio Club Paraguay

Post Box 512,

Asuncion, Paraguay.

Confirmed contacts are required with each of the nine ZP call areas.

### Heard All Continents

The award is available to shortwave listeners. QSL cards dated on and after 30th July 1952 are valid. Do not send QSL cards. A list showing full details of the stations heard should be certified by the Awards Manager.

The fee for the award is five IRCs. The address for application is:

JARL Awards Manager,

Post Box 377,

Tokyo Central, Japan.

Rules: Continental limits are those defined by the IARU.

Requirements: One QSL card is required from each of the six continents: North America, South America, Europe, Africa, Asia and Oceania.

The award is available to licensed amateurs. There are no date limitations. Only log data is required for the award, and full details should be sent to the sponsor.

There is no fee for the award. It is suggested

## Key Section

with Deane Blackman VK3TX

Box 382, Clayton, Vic., 3168

Since the last list, we welcome as new members to the section VK3JYL, VK4GX and VK4KO. I am again being with preparation of certificates, and am having trouble finding a method of sending them which will withstand the assaults of the postal system, but you will get them.

The section will be losing the services of Russ, VK3KX, who has assisted in VK3 and made valuable suggestions in the early days of the section. Thanks for your help, Russ.

My comment about CW in the Ross-Hull raised a couple of letters (for which I thank the authors), but I will remark on one point only from these which seemed to me to question the motives of the Key Section in urging the use of the mode in what is undisputed phone territory. Let me say that the Key Section has no view other than trying to make the most opportunities available to those who enjoy key pounding. As I see it, that includes the continuance of a CW section in the VHF contact. The politics of the matter of course are that if nobody uses the opportunity it will go away, so some encouragement does not seem out of place.

For VK3 there is another slow mode transmission becoming available shortly through the members of the Western Suburbs Club: 1900 local, on 1808 kHz, and as I understand it this will be nightly during the week. A good effort.

Merv, VK450, wrote to me before Christmas suggesting that if a Section might look into the Hi-Sound key being advertised in AR. Getting a satisfactory hand key is becoming a positive impediment for some in using the mode. As a result Ivor, VK3XB, has been playing with one of these and his testing has been extensive enough to warrant a separate report for 'ie magazine. One comment Ivor made in his report (I for one can anticipate his article) was that the key sits pretty high, so that you cannot easily use the technique of resting your forearm on the table edge. I am not sure how many who train for the sending test for the ACP realize that the PMG key sits at the front of the table. I for one can remember being much disturbed by this discovery, made at the exam.

## Ionospheric Predictions

with Howard Rider, VK3ZJY May, '74

This month's predictions from information supplied by the Ionospheric Prediction Service Division indicate point to point band openings for at least 50 per cent of the month. Times quote are GMT.

<b>28 MHz</b>		
VK2 to W6	2200 - 0400	
VK4 to KH6	0100 - 0500	
VK7 to VK9	0500 - 0800	
<b>21 MHz</b>		
VK2 to ZL	0400 - 0800	
SU	2100 - 0600	
KH6	0600 - 0700	
ZS	0100 - 0500	
VK0	0600 - 0800	
VK3 to UA	2100 - 0500	
KH6	2100 - 0700	
JA	2200 - 0800	
9G1 (SP)	0700 - 0800	
VK4 to KH6	2200 - 0800	
ZS	0500 - 0700	
VK0	2200 - 0600	
VK4 to UA	2100 - 0500	
W6	0500 - 1000	
ZS	2300 - 0500	
KH6	0500 - 0800	
VK6 to G (SP)	2100 - 0700	
ZL	2400 - 0600	
ZS	0200 - 0900	
VK7 to VK9	0600 - 0700	
W6	0300 - 0800	
<b>14 MHz</b>		
VK2 to G (SP)	0900 - 1000	2100 - 2400
G (LP)	0600 - 0900	2100 - 0300
SU	1500 - 1900	2100 - 0300
VK0	2200 - 0700	
W1	0100 - 0500	1200 - 1600
ZL	2100 - 0700	
VK3 to JA	0600 - 1000	1800 - 1800
VE3 (SP)	0200 - 0400	1200 - 1600
VE3 (LP)	2300 - 0200	
VK9	2100 - 1000	1600 - 1800
UA	1500 - 1900	2200 - 0200
ZS	0400 - 1000	
VK4 to W6	0200 - 0900	
VK0	2100 - 0900	
JA	0800 - 1100	
UA	0800 - 1000	1300 - 1400
VK5 to KH6	0300 - 1500	1700 - 1800
PY	2300 - 2400	
9G1 (SP)	0800 - 0800	2300 - 0200
9G1 (LP)	0300 - 0400	0800 - 1000
VK6 to PY	1000 - 1100	
UA	1100 - 1200	2300 - 0300
W1	1100 - 1200	
ZS	2200 - 0800	
VK7 to G (SP)	1800 - 1900	2200 - 0100
SU	2300 - 0500	
VK0	2400 - 0500	
W6	0100 - 1000	1600 - 1800
<b>7 MHz</b>		
VK2 to G (SP)	1800 - 2100	
W6	0700 - 1400	
VK3 to JA	0700 - 2000	
VK4 to 9G1 (SP)	1800 - 2100	
VK0	0400 - 2300	
PY	0600 - 1000	
VK5 to KH6	0700 - 1700	
VE3 (SP)	0700 - 1100	
VK6 to ZL	1600 - 2400	
SU	0700 - 2100	
VK7 to VK9	0700 - 2100	
UA	1500 - 2200	

**Historical Section wants old mags, papers, articles, photos, drawings—up to W.W.2—for copying or as donations. Please write VK3ZS, QTHR or WIA Executive office.**

## Hamads

- \* Eight lines free to all W.I.A. members.
- \* Copy should be in block letters or typscript, sign and forwarded to The Editor, P.O. Box 150 Toorak, Vic. 3142.
- \* QTHR means that the advertiser's name and address are correct in the current Australian Callbook.

### FOR SALE

**Lalalyte Receiver** HA800, 80 to 6 metres solid state, as new. \$160. Ph.: (02) 663 7336. VK2KA, QTHR.

**Receiver Indicator Unit** RAAF Type R65/APN9. \$10. AR7 complete with PSU rack and manual. \$80.

**Receivers** BC455 and CGT46106, 6-9.1 Megs. \$15 each.

**Modulator A & R, Valve Type** AM with 3 transformers and 3 807s. \$10.

Will separate, or the lot for \$100. VK3YBW, QTHR. Ph.: (03) 52 2661.

**Yaesu FT101 Transceiver**, 160-10m, complete with MIC, manual, AC/DC plug, excellent condition. \$425. VK3SB, Ph.: (03) 55 03521.

**13AVG 10-40m**, trap vertical antenna with instructions. Worked. DXCC. \$30. VK3BCY, QTHR. Ph.: (03) 848 4775.

**Endless Cassettes**. Ideal for CW and Phone Qs, SSTV Video Qs, Station and operator identification, Test patterns etc. A few new and sealed 30 and 190 second TDK compact cassettes available at \$3.50 each, postage paid. Hear in use on 14230/21340 SSTV. VK1AU, QTHR.

**FT 75**, with companion external VFO and AC and DC (mobile) power supplies. \$300. Write Alan VK3LW c/o Box 520, Geelong or Ph.: (03) 341 2432 B.H.

**FT161, mixer and fan**, as new condition. \$485. VK3TG, QTHR. Ph.: (056) 52 1636.

**3 x 16 Torque**. Full 3 in. x 9 in. seasoned timber (undercoated). All braces, brackets, nuts and bolts. Ring Mr. Sinclair FR7 96 966, after 6 p.m.

VK2SK, QTHR.

**Swan 550 SSB Transceiver**, AC and DC, PS, excellent condition, with manual. \$330. VK3ADN, QTHR, but Post Code 3324. Ph.: Lismore 139 (evenings).

**VK3 576 MHz Converter**, complete with crystal, wired and tested. \$26.

**VK3 FM Car Phone**, IF stages, complete with crystal, wired and tested. \$46. VK3BEC, QTHR.

**FTDX 566 Transceiver** with noise blanker, 160 metre crystal and kit included, perfect condition, \$440 ONO. VK2BQ. GPO Box 3598, Sydney, NSW 2001.

**FREE**. Box pre-1935 bits, mainly junk but useful. You can have if you collect. VK3XT, QTHR.

**GONSET GBB-190 100W PEP SSB/CW XMTX** 80-10m, good cond. w/spare. 6DQ5 final tube, \$140 ONO.

**Phillips EL3542 tape recorder** with accessories, good cond. \$50 ONO. You pay freight. VK4ZV, QTHR. Ph.: (072) 82 2651. AH, (072) 80 2697 Bu.

**AWA low band tx, rx, and h.d. 12V supply** \$12. L6G11 Sig generator \$25. Class C Wavemeter \$10. 6 and 12 volt battery charger \$8. Heavy duty power transformers, chokes, quantity 100 ohm co-ax cable, valves, crystals, etc. VK3AHQ, QTHR. Ph.: (03) 286-2024.

**Receivers** specially built for SWLs. 6 Aw. bands 160-10 metres. 16 valves. A/C operated. \$160. Transistor Receiver. 80-40-20-15 metres. AC or DC operated. 12 volt. 17 transistors and 6 Fets. \$100. **Personal Adapter**. 455Kc 1/1. Type SA-3 T/200. \$60. H. L. Roach. Ph.: (03) 58 375.

**Galeo GT550 Transceiver**, 550 watts, with Matching speaker cabinet, built in PSU. Excellent order and condition, complete handbook. \$425.00, had from new, or exchange for Yaesu FT75, cash adjustments. VK7MG, QTHR. Ph.: Swansea 220.

**Yaesu FT200** with PP 200 AC power supply, \$300 ONO. Matching 160 metre transceiver, \$30. VK3AVO, QTHR. Ph.: (03) 544 4109 AH.

## OBITUARY

**CHRISTOPHER BRUCE DEIN, VK2ZBK**

Died March 15th, 1974.  
Amateurs were saddened to learn of the sudden passing of Chris, VK2ZBK, on March 15th at the early age of 22.

He had impressed the many amateurs on the VHF bands with his bright and friendly personality and willingness to help at all times. Chris enjoyed his hobby to the full. Only two weeks before, at the Gosford Field Day, he had entered most events to win one of them.

Few knew of his long standing illness that was eventually to take him from his family and friends. All associated with him were privileged — Chris was a true amateur in every way.

First licenced in 1968, whilst still at school, he was active from home and mobile on the 144 and 52 MHz bands. Perhaps he was proud of his 525 mobile FM signal that was heard in many parts of the continent.

To his father George, his mother and family and to his fiancée Joy, amateurs extend sincere sympathy.

VK2ZH

**Audio Oscillator**, AWA R7077, \$30; Frequency Meter BC221-AL, \$30. Both good order, VK3AM, 81 Cave Ave., Bridgewater 5155. Ph.: (08) 338 2084.

**Oxford black hammetone transceiver** cases in cadmium plated steel, 2 off. Included are 2 inch subcases. Size 7 inches by 14 inches by 10 1/2 inches deep. VK3BDN (03) 848 3598. QTHR.

**RME Converter VHF**, freq. range 48.5 to 54.5, 143.5 to 148.5, 219.5 to 225.5, \$85. Old Magnavox speaker box approx. 1920. Offer. VK2UV, QTHR. Ph.: (02) 709 6593.

**Copies of QST 1970-74** price plus freight paid. VK2KE, QTHR.

### WANTED

**Information on Wireless Set** No. 38 MK2 7.4 to 9 MHz. Also Valves for above 3 x VP23 (ARP12) and 1 x V248A (ATP4). VK3YBW, QTHR. Ph.: (03) 52 2661.

**Digital Trainer** as in March 1973, EA or similar. Ph.: (02) 663 7336. VK2ZKA, QTHR.

**Circuit of PYE PTC 8204 LW FM transceiver**. VK1DV, QTHR.

**Yaesu FT DX 466 transmitter**, details of any extras or mods to VK3BQ, QTHR. Ph.: (052) 71 886.

**SSB Transceiver** (pref. multi-band) for mobile use. Details to: VK2AF, QTHR. Ph.: (042) 81 4387 AH.

**Good Gelliam ART 13** with HT and Bias Supplies 60 watt CW and AM, all band CW circuitry if 'o swap for 12V 2MX carphone or similar. VK2SL, QTHR.

**Circuit Diagrams of TV sets**, circuit diagram of Tams AM1000 Transceiver and a good accurate Signal Generator. State price and condition of all items. T. Bird, 75 Horatio St., Annerley 4103, Brisbane.

**Circuit and/or Manual for RX TCA 86223**. Please contact Cal Bryant, 18 Arnold St., Holland Park, Qld. 4121.

**Inductor 30 mH**, variable by Roller Type Wheel. Must be complete with indicating mechanism and suitable for home brew ATU. VK3CN, QTHR. Ph.: (03) 546 1916.

## E M C

It is intended that September AR will be an EMC issue . . .

Any articles on Interference and EMC generally will be gratefully received.

Dead line — 30th June

## 20 Years Ago

with Ron Fisher VK3OM

MAY 1954

It's always interesting to look back at the gear we used in the past and make a few mental comparisons. A full page advertisement by one of our large disposals dealers of the time gives an indication of what was available and presumably what the average amateur thought of as desirable around May 1954.

Try a few of these, Marconi communication receivers type 1155 at £45, Bendix compass receivers type MN26 at £27. Or what about a Bendix G99 transmitter, often found in the "best" amateur shacks, at only £37/10/-. Perhaps if you couldn't quite run to a G99, a Marconi 1154 transmitter at £12/10 or an AT5 transmitter at only £9/17/6 would fill the bill. For the home brew man what better than a few TU tuning units at £2/10 or £3/10 for the TU68 which covered the 80 metre band and had variable condensers ideal for all band transmitters.

I think we are getting rather better value for our money these days. May 1954 Amateur Radio featured the following state of the art technical articles. Hans Ruckert VK2XOU continued his series on receiver selectivity problems. The double crystal filter was discussed along with a practical application of it in a typical amateur receiver.

Tom Athey continued his "Complete Amateur" with the aerial tuner and two power supplies. In typical fashion of the time a 300 volt 200 millamp supply took up no less than a 17 inch x 16 inch chassis. After all we had to fill that six foot rack come what may.

21Mcs. On the BC348 Receiver by L. Ellison VK3ALE. The 200 to 500 kHz range was modified to give band spread tuning of the new 15 metre band. Perhaps the same technique could be used to provide continuous coverage from 18 to 30 kHz on this still popular receiver. An easily built audio frequency meter reprinted from QST shows how to achieve spot-on frequency checks in the amateur bands in conjunction with a 10 kHz crystal locked multi-vibrator.

## technical articles for ar

- preferably typewritten manuscript, but hand-written acceptable.
- double spaced, one inch margins, one side only of quarto or foolscap sheet.
- spelling and grammar entirely optional; editorial staff will polish.
- drawings made by AR staff from sketches submitted.
- good, clear, glossy photos welcomed with open arms. do not forget captions.
- send it now to:—  
P.O. Box 2611W,  
Melbourne, 3001.

### ● WIA PUBLICATIONS

RTTY-7B Vol. 1

Net Wt.

\$2.50 105g

Vol. 2 (nearly ready)

\$3.00 220g

Log Book (VK6 model \$1.00

1973 WIA Call Book \$1.20 120g

### ● Back issues of A.R.

March 1972 onwards except June, July, Aug., 1972 and April 1973, all of which are out of print—

1972 issues 30c each

1973 issues 40c each

1974 issues 50c each

each approx. 75 g

Please add sufficient postages for each order

### ● Magazine Subscriptions

Under revision—please refer to list on page 7, AR, February 1974

● OTHER ITEMS—Please write for new list

W.I.A. "MAGPUBS"

P.O. Box 150, Toorak Vic., 3142

## GEELONG HAMFEST

Over weekend 11th and 12th or May 1974.

### SATURDAY

1400 hours onwards: Rag-chew, Registration, Car Phone checks, Dinner and Entertainment.

### SUNDAY

Display of Commercial equipment, Car Phone checks, Scrambles & TX Hunts on both 40 and 2 metres. Disposal sale, Appetising lunch. Entertainment for everyone.

### FURTHER DETAILS

ALAN BRADLEY  
VK3LW Secretary,  
Geelong Amateur Radio Club,  
Box 520, Geelong 3220, or  
Telephone Bob Wookey,  
Geelong (052) 21-2674.

### World Clock

Precise time for any of the world's time zones displayed simultaneously at the turn of the dial. A.M. P.M. 4 1/2" high.



## A timely revolution

Data Time announces its galaxy of time systems... revolutionizing the universe of time measurement and display. With electronic digital indicators developed for space-age instrumentation and electronic circuitry for computer-like operation.

Choose one of nine trendsetting designs from this exciting new collection. Each piece is individually numbered. These special editions are now available at the finest jewelry, specialty and department stores in your area. See them today \$75 to \$300.

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TIME**

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## Technology Products

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45 Birch Street, Bankstown, N.S.W. 709-5822

# INOUE COMMUNICATION EQUIPMENT CORPORATION



## 'ICOM' VHF & UHF FM TRANSCEIVERS

Model:	IC-60	IC-22
<b>General</b>		
Numbers of Semi-Conductors Employed:		
Transistors	32	33
F.E.T.	4	5
IC	1	1
Diodes	20	20
Power Source: (Negative Ground)	13.5V ± 20%	13.5V ± 20%
Current Drain: Transmit HI-10W	2.1A	2.1A
Transmit LO-1W	1.2A	1.2A
Receive at Peaking	350mA	350mA
Receive Average	150mA	150mA
Antenna Input:	50 ohms	50 ohms
Dimension: H x W x D in mm	58x156x216	58x156x216
Net Weight:	2 kgs.	2.1 kgs.
<b>Transmitter</b>		
Frequency Range: MHz	50-54	144-148
Band Spacing:	1 MHz	2 MHz
Channels: Crystal Controlled	12	22
RF Output Power: Switchable	10W as HI (high) and 1W as LO (low)	
Mode: (Phone by FM)	F3	F3
Max. Frequency Deviation:	±5-15KHz	±5-15KHz
Modulation System:	Variable Reactance Phase Modulation	2x2x2
Multiplication:	2x2x2	2x2x2
Spurious Radiation:	—60dB or less	—60dB or less
Microphone: Dynamic P.T.T.	10 K/ohms	10 K/ohms
<b>Receiver</b>		
Frequency Range: MHz	50-54	144-148
Band Spacing:	2 MHz	4 MHz
Mode: (Phone by FM)	F3	F3
Receiving System:	Double Super Heterodyne System	
IF: 1st MHz, 2nd KHz	10.7 & 455	10.7 & 455
Sensitivity:	a. Better than 0.4 uV at 20 dB quieting b. S+N/N at 1uV input, 30 dB or more —60dB or less	a. Better than 0.4 uV at 20 dB quieting b. S+N/N at 1uV input, 30 dB or more —60dB or less
Spurious Response:	a. ±8V/±15KHz at —60 dB point b. ±16V/±25KHz at —60 dB point —8 dB	a. ±8V/±15KHz at —60 dB point b. ±16V/±25KHz at —60 dB point —8 dB
Squelch Sensitivity:	1.5W	1.5W
Audio Output: 8 ohm		
<b>PRICE:</b>	<b>\$198</b>	<b>\$198</b>

### ACCESSORIES

Microphone, Microphone Hook, Power Cord with Plug, Spare Fuses, Mobile Mounting Apparatus, External Speaker Plug, and Silicon Cloth.

FOR OTHER MODELS SEE MARCH "AR"

## VHF FM, PHASE LOCKED LOOP SYNTHESIZED VFO TRANSCEIVER

Model:	IC-211
<b>General</b>	
Semi-Conductors Employed:	
Transistor	54
F.E.T.	13
P.U.T.	2
IC	6
Diodes	53
Power Source:	DC 13.8V ± 15%*
Antenna Impedance:	50 ohms Unbalanced
Current Drain: Transmit HI 10W	Approx. 2.5A
Transmit LO 0.5W	Approx. 1.2A
Receive at Peaking	Approx. 600mA
Receive Average	Approx. 400mA
Dimension: H x W x D in mm	111 x 230 x 260
Net Weight:	5.4 kgs.
<b>Transmitter</b>	
Frequency Range: MHz	146-148 Variable
Band Spacing:	2MHz
Main Channel Selector:	146.9MHz
Mode: Phone by FM	F3
Channel S Power: Variable	10W-0.5W
Frequency Deviation:	±5KHz
Modulation System:	Variable Reactance Phase Modulation
Multiplication:	(133-137MHz + 10.7MHz) x 1
Spurious Radiation:	—60 dB or better
Microphone: PTT Dynamic	500 ohms
<b>Receiver</b>	
Frequency Range: MHz	146-148 Variable
Band Spacing:	2MHz
Main Channel Selector:	146.9MHz
Mode: Phone by FM	F3
Receiving System:	Double Super Heterodyne
Intermediate Frequencies:	1st 10.7MHz 2nd 455KHz
Sensitivity:	a. Better than 0.4 uV at 20 dB quieting b. S+N/N at 0 dB input, 30 dB or more
Band Width: —6 dB Point	±8KHz
Spurious Response:	±16KHz
Squelch Sensitivity:	—60 dB
RIT Coverage:	±8KHz or more
Audio Output Power: at 8 ohms	Over 1.5W
Marker Frequencies:	30KHz or its multiples by integral numbers

### PRICE:

**\$356**

Also available: IC30 for 430-450MHz \$328. Details on request.

NOTE: Available Regulated DC Power Supply Unit for AC Operation for 100, 117, 200, 220 & 240V. Model IC-210 and 211 have inside space for such unit. Available Duplex Communication through Repeaters. Duplex by ±600KHz installed in IC-211.



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TELEX 32720





**MONITOR  
SCOPE**  
MODEL SB-610



- Provides accurate Display or Transmitted AM CW
- RTTY Signals.
- Shows signal envelope, A.F. and R.F.
- Shows receiver I.F. envelope with IF's up to 6MHz.
- Operates 160-6 Metres. 15W - 1kW.
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# YAESU VHF CURRENT MODELS



**MODEL FT-620** six metre SSB/AM transceiver, 50-54MHz capability in 8 segments, equipped for 52-54MHz. May be operated from 234V AC or 13.5V DC. Includes built-in VFO, noise blanker, speaker and microphone.

**MODEL FTV-650** six metre transverter, 50-54MHz capability in 8 segments, equipped for 50-54MHz. Designed as an auxiliary unit with a Yaesu transceiver or transmitter/receiver combination on tunable ranges covering 28-30MHz. Power is derived from driving unit.

**MODEL FT-2FB** two metre FM, fixed channel transceiver, 12 channels capability, equipped for three channels, installed ready to operate. Operates from 12V DC in mobile service. Matching AC power supply Model FP-2 is also available for base use. Microphone included.

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"The G.P.O. is opposite"

Phones 60-1475-6-7

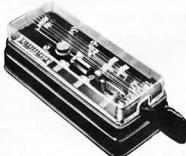
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# SIDEBAND ELECTRONICS ENGINEERING

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FT 101 B AC/DC 160 to 10 M and fan	\$525
FT DX 401 AC supply built-in	\$495
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FL 2100 linear amplifiers	\$375
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FT DX 400/560 noise blankers,	\$20
For YAESU MUSEN FT-101 and FT-101B, 560 and 401 users, a digital frequency read-out counter, made for the YAESU sets but coming from the U.S.A., plugs straight into the transceivers and reads the operating frequency to 100 Hertz measures 8" wide, 3" high and 7" deep with clear LED digits,	\$175



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**KCP-2** NICAD battery chargers & 10 NICAD batteries \$35

**KLM ELECTRONICS** solid state 12V DC linear amplifier, 12 Watt output with 1 to 2 Watt drive, ideal for the KEN KP-202, with automatic antenna-change-over when driven \$50

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**Model XCR-30** Mark 2 portable crystal controlled communications receivers, cannot get enough of them from South Africa, when available \$225

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**TH 3 Mk 3 10/15/20 M** senior 3 el. Yagi, 14' boom 40 lbs weight 1 KW \$145

**TH6DXX 10/15/20 M** senior 6 el. Yagi 24' boom 60 lbs weight, 1KW \$175

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All with control/indicator units

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